MAR. 13 1959

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

Another drop in exploratory drilling last year may mean lower reserves 11

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Special Report: It's getting harder, costlier to locate new big reserves 42

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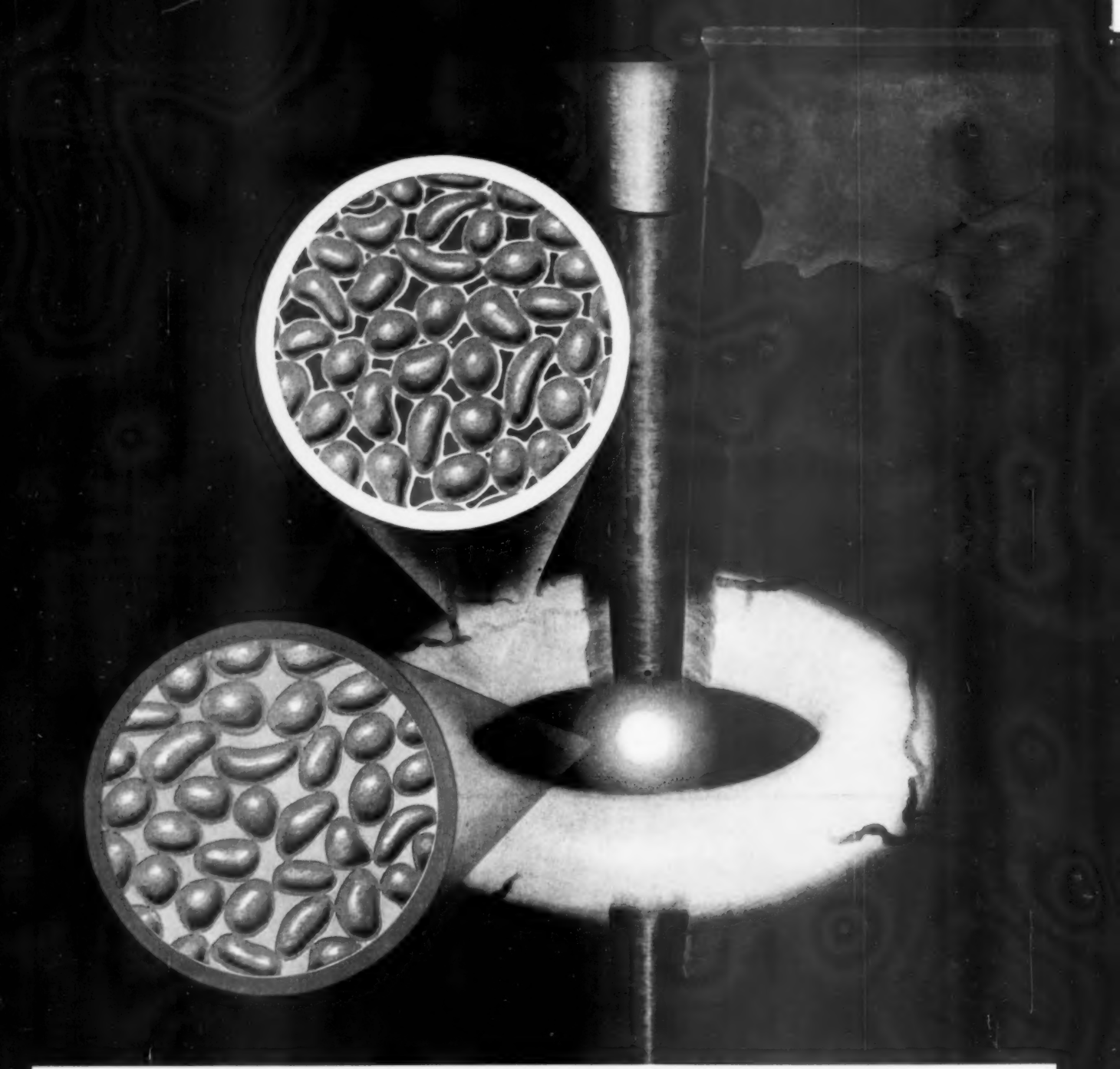
This is Ethyl's Bob Kimpton



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Automotive Engineer in the Eastern Region

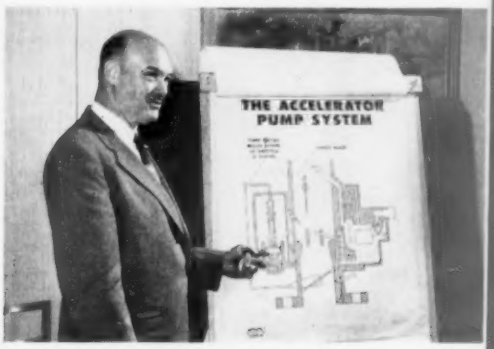
Bob Kimpton has more than 20 years' experience with gasoline engines; for racing cars, boats, airplanes—as well as for passenger cars, trucks and farm tractors.

After formal training at Ohio State University, Bob began his broad automotive experience in an automobile plant. In 1937, he joined Ethyl to tune and operate engines for chassis dynamometer demonstrations. Three years later he went into the field as an Automotive Service Engineer.

Like other Ethyl automotive specialists across the country, Bob keeps up to date through Ethyl's Technical Service group in Detroit, who are in continuous contact with the automobile manufacturers.

1. With a fleet superintendent and oil company representative, Bob discusses how proper engine adjustments can affect operating economy. Helping to keep oil company people and their customers up to date on automotive developments often leads to improved preventive maintenance and greater product satisfaction.

2. Another fleet garage had chronic difficulty with a certain model truck. Working closely with the oil company representative, Bob pinpointed the cause and suggested steps to correct it; at the same time proving that petroleum products were not at fault.



3. Before an oil company group, Bob explains the functioning of various engine components. Like all Ethyl Automotive Engineers, he has found his specialized knowledge and experience increasingly valuable to oil company training programs.

4. For these fleet operating people, Kimpton reviews high lights in Ethyl's latest survey and report, "Trends in Heavy Duty Fleet Operation." Such specialized information helps fleet operators and oil company engineers keep abreast of practices in the commercial field.

Ethyl Automotive Engineers work regularly with oil companies . . . typifying Ethyl's belief that service is just as important as product.

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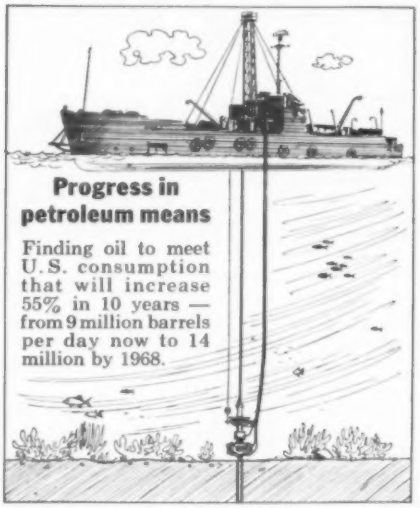
Actually, this benefits you as well as Standard. It means an adequate reserve of our most valuable national resource, to be drawn on in days ahead to provide the thousands of products from petroleum so essential for your daily needs.



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A McGRAW-HILL PUBLICATION

PETROLEUM WEEK **March 13, 1959**
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INSIDE *Slant*

NEW INVENTORY APPROACH

The Texas Railroad Commission is taking a new approach to adequate stock levels in the annual survey to be made at its Mar. 19 hearing.

The commission wants to know this time what the industry considers to be adequate crude stocks of Texas origin.

Heretofore, it has asked for estimates only on a national basis. Not only as to crude, but also for all products.

The state oil regulatory body is also asking the industry to report on what it considers to be adequate crude stocks east of California.

Some of the companies are finding it a little difficult to break down their estimates into the three levels, but the answers are important to the commission.

It must be remembered that the commission's chief concern each month is to set an allowable that will fill the demand for Texas crude.

If this is to be done, then it is necessary that the commission know what the industry considers to be the proper level for stocks of Texas origin.

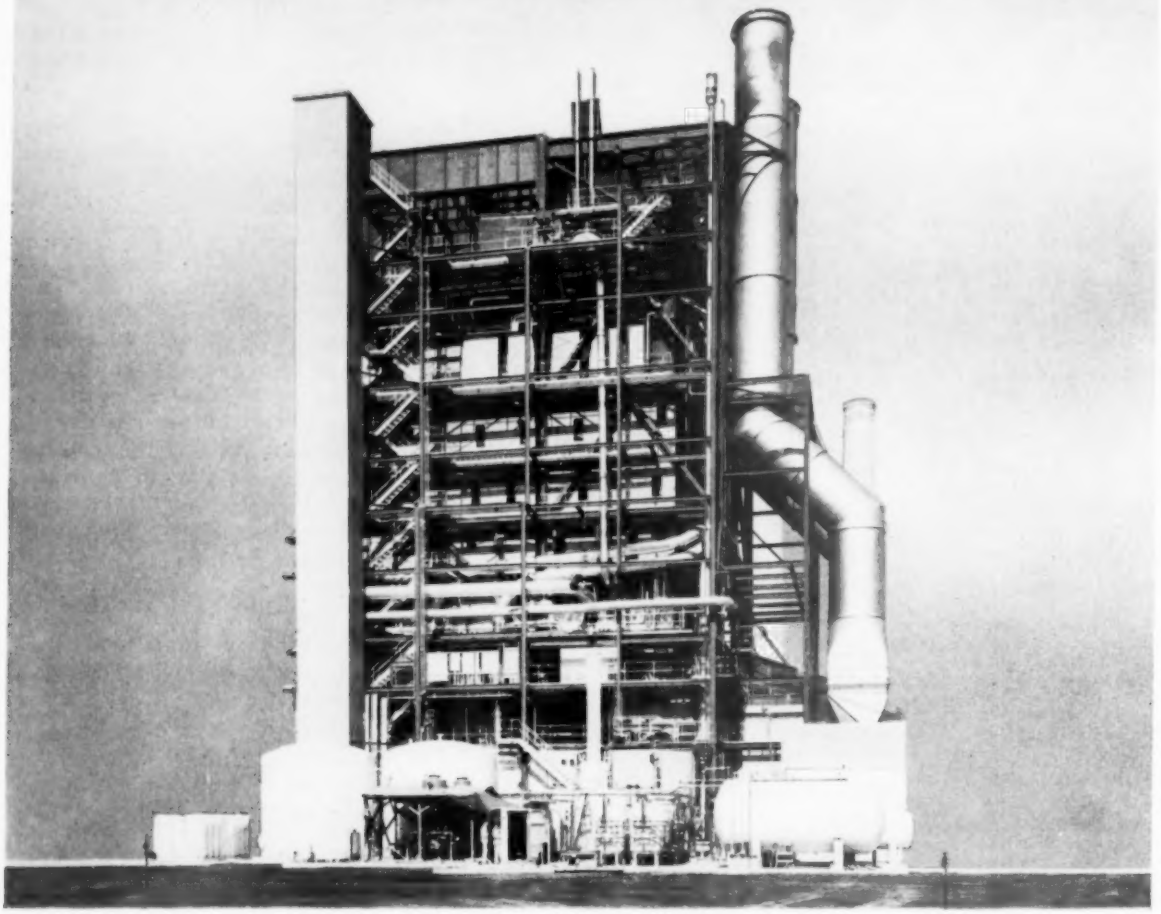
The commission has omitted imports from its questionnaire. Companies make monthly reports on them anyway.

LeRoy Menzing
EDITOR

MEMO To: CORROSIVE ENGINEERS

From: AVONDALE (AVONCRAFT DIVISION)

Subject: VERSATILITY AND PORCELAIN ENAMEL



A case in point . . . porcelain enamel was used extensively in this Louisiana Power & Light Company boiler at Sterlington, La., to thoroughly weather proof it from top to bottom. The roof is of porcelain enamel, the entire sides are generally encased with this same material, and porcelain is worked into the curvatures of the pre-heaters and stack uptakes.

Our point is . . . porcelain enamel is extremely versatile for industrial applications of all kinds. It is engineered to your purpose, prefabricated and porcelainized at our plant eliminating fitting in the field which would produce raw edges subject to rusting. Other plus factors include: color, no periodic painting or replacing, durability.

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DEPT/Opinions

Views That Make News . . .

"In the present Washington climate, it is increasingly apparent that the intrinsic merit of particular legislation affecting business is becoming of secondary importance.

"Politics and vote-getting are predominant considerations, and pressure groups representing organized minority interests can exert a more potent influence in the legislative halls than logic, reason, or truth."

—HAMMOND E. CHAFFETZ
Chicago oil attorney

"Our present plans are that by mid-1959 we will offer a complete conversion kit to convert any present automobile into electric drive."

—ANTHONY J. MORRONI
President
Electric Equipment & Engineering Co.

"We keep learning over and over again the thing that we have always known: In marketing activity particularly it is the quality of the people that we have representing us that is important . . .

"We know perfectly well that we can have a service station with a poor dealer in it and he will sell, say, 10,000 gal. a month. That same station, with a good dealer running it, will sell 30,000 gal. a month."

—R. L. MINCKLER
President
General Petroleum Corp.

"Some analysts are wondering if recovery may not prove to be a 'W' shape, with a letdown between now and autumn, followed by a renewed recovery."

—JOHN D. WILSON
Vice-president
Chase Manhattan Bank

. . . and Letters

Dear Sir:

May I take this opportunity to compliment you on your very fine editorial entitled "Memo to Senator Douglas: Depletion Is Not a Tax Loophole" [PW—Feb.20'59,p128].

It is particularly constructive inasmuch as you direct your remarks, which are based on sound government statistics, to one who has charged so often that the present 27.5% percentage depletion rate for oil and gas is a loophole.

Quite naturally we are pleased that you recognize the part IPAA has played in our attempt to give wide distribution to Mr. C. C. Anderson's study.

I'm sure you will be intersted in knowing that we have been having exceptionally fine acceptance of our pamphlets entitled "Oil and Gas Depletion Facts."

RUSSELL B. BROWN
General counsel
Independent Petroleum Assn. of America

Dear Sir:

We read with great interest your information about "Shell Sets Turbodrill Drilling Records" [PW—Feb.6 '59,p26].

We thought you and your readers would be interested in knowing that, to our knowledge, the two aggregate records of longest footage drilled with a diamond bit, in the longest single run with a turbodrill, still remain the ones we set during April, 1958, in the Bastennes-Gaujeac No. 1-bis well (Southern France).

In this well, an 8-7/16-in. Christensen diamond bit coupled with a 7⅝-in. 157 stage Tiraspolsky turbodrill, drilled during a single run of 126 drilling hours a total of 826 ft. in limestone between depths of 9,529 ft. and 10,355 ft.

Single runs of 100 hours to 200 hours are nowadays current in French turbodrilling practice.

R. HENQUET
Societe d'Etudes Petrolieres
Paris, France

Dear Sir:

Being a subscriber, I was wondering if you have copies of the "Oil Man's Album" which are suitable for framing. If so, please send them to me.

A. G. HOOPER, JR.
Shreveport, La.

● *Editor's note: Unfortunately, we are not able to fill the request from Mr. Hooper (and from many other subscribers since the "Album" series began). In almost all instances, the pictures were borrowed from companies or individuals and have been, or will be returned.*

PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing, Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*

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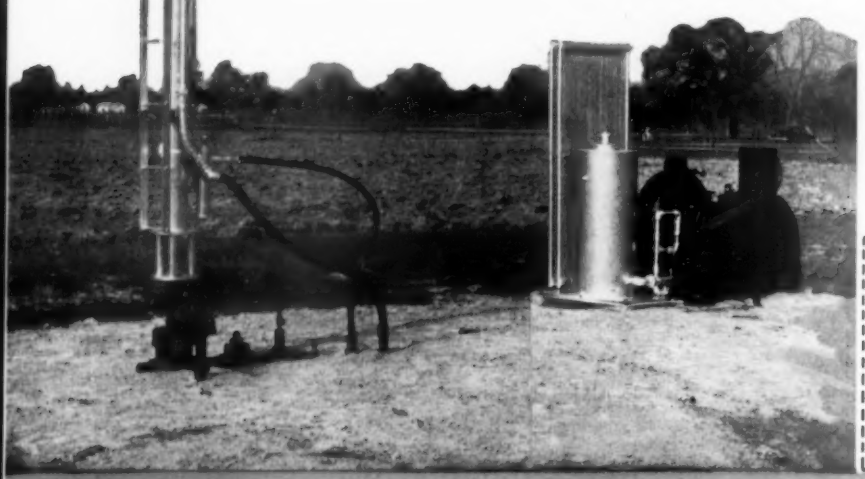

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60-Second Summary / WHAT'S HAPPENING IN OIL

March 13, 1959

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The government slapped strict controls on petroleum imports this week with the warning that price controls might follow. The new mandatory plan covers crude and all products. Any price increases for crude and products will be subject to government review based on "necessity" to national defense. . . . p. 14

•

Exploratory drilling in the U.S. declined for the second consecutive year in 1958, even though the success ratio improved slightly. The decline indicates another drop in domestic reserves. . . . p. 11

•

The handwriting on the wall is plain: Find more reserves at lower cost. But a Special Report/Exploration points out that the problems involved in attaining such a goal aren't so simple. However, some headway is being made. . . . p. 42

•

Computers may be able to help solve the age-old problem of fitting the right man to the right job. The machine can be used to process data on job requirements and on employees—and it makes more frequent and more comprehensive employee reviews feasible. . . . p. 80

•

Joint use of alkylate facilities may prove a boon to small refiners trying to keep up in the octane race. Such a sharing program is being tried by two Texas firms. . . . p. 71

•

Success ratios in formation fracturing may be boosted 50% or more. That's what Dowell has found in the use of a new technological development called "frac guide." . . . p. 21

•

The nylon barge appears to be proving itself. One firm has used one of the 100-ft.-long "sausages" to haul 10,000 gal. of kerosine. And signs of active interest are cropping up at numerous other points. . . . p. 62

•

Is there real cooperation between the oil and auto industries on common lube problems? Two men who should know say some effort is made, but not enough. For instance, lube manufacturers need more advance notice of changes in engine designs. . . . p. 74

•

Advertising campaigns are now being mapped to boost spring sales of gasoline. The approaches vary, of course, but some new selling slants are upcoming. . . . p. 86

•

A unique portable drilling mast is being used in Austria. It includes twin columns which are raised simultaneously, then joined at the middle and the top. . . . p. 34

Up to the Minute / SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK Copyright

March 13, 1959

Mandatory import controls and the threat of possible price controls later could mean:

- Normal seasonal price advances for petroleum products may be subject to challenge by the government.
- Importers, pressed by tighter allocations, will gear the quality of imports to maximum refinery realization.
- More domestic crude will be used for asphalt making.
- Processing deals for foreign crude will end.

•

Industry reaction to mandatory controls varies widely:

- **Most producers feel the new plan will help—a little.** At least, they say, it will prevent further inroads by imports. But some figure it's too little, too late. "Imports are just being rolled back to a level we already found out we couldn't live with," says a Texas producer.

- **Many refiners are noncommittal at present,** although the independents—especially the smaller ones—figure they're being helped.

- **Marketers will make the most noise.** They are already threatening to throw their weight behind a depletion-cut drive. However, some feel the control action may steady product prices, lessen price wars.

- **Tanker operators are tightening their belts,** facing definite limitations which may restrict their growth. However, Gulf Coast-to-East Coast traffic will increase, probably with firmer rates.

•

The President's warning against price hikes is creating a stir. But at least one industry official takes this view: "What's the difference between prices being held down by the government or by uncontrolled imports?"

•

Canada is protesting, but Venezuela isn't doing so yet. A top Venezuelan oil official doesn't think his nation's production is going to be hurt.

•

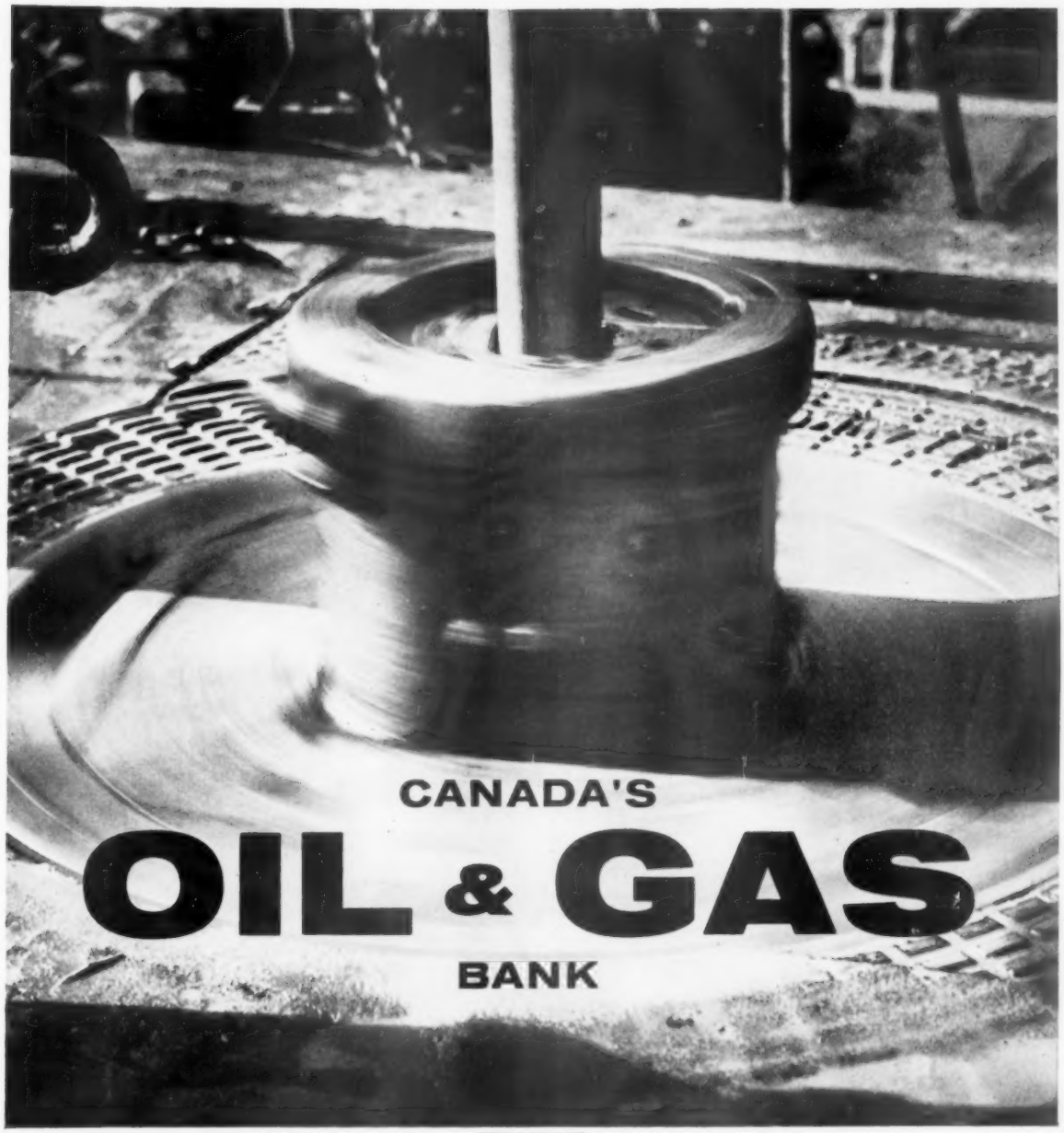
Construction of a 419-mi. Mediterranean-to-Rhine crude pipeline has been approved by the DeGaulle Cabinet. It will run through eastern France to Strasbourg.

•

Synthetic "natural" rubber will reach commercial production this year. It is already in use on a small scale, but Shell Chemical plans to step up output.

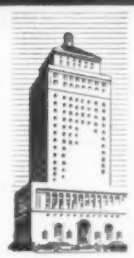
•

Stripper wells have increased by one-third in the past decade, to total 372,519, accounting for 18.1% of U. S. crude output. But the average production per well has remained fairly static, at about 3½ b/d per well, according to Interstate Oil Compact Commission studies.



The Royal Bank of Canada provides a banking service to the oil and gas industry that is comprehensive, and in many respects unique. Largest in Canada, and ranking fourth among all banks in North America, the "Royal" has over 300 branches in the western provinces alone, serves every area of oil and gas development where local branches provide on-the-spot service.

In Calgary the Royal Bank's Oil and Gas Department is set up to provide banking facilities geared to the particular needs of oil and gas men. Officers are practical oil bankers, with long experience in the business. This department's current "Oil and Gas Bulletins"—dealing with regulations, tariffs, financing, basic statistics and kindred subjects—are available on request to The Royal Bank of Canada, Oil and Gas Department, 409 Eighth Avenue West, Calgary, Alta.



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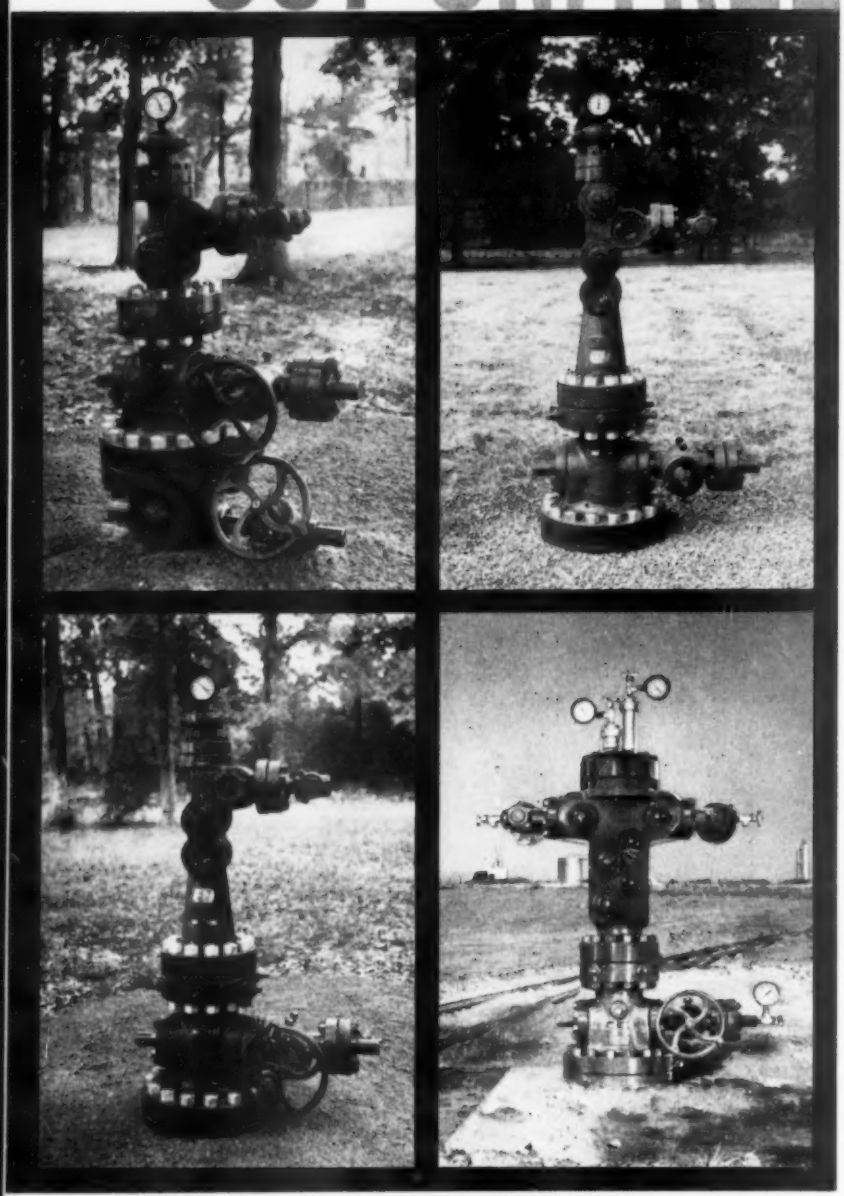

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For additional details on the Unitree, contact an O-C-T representative, or write to Oil Center Tool Co., P. O. Box 3091, Houston, Texas.

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Exploratory Drilling Off 10.3% in '58

Year	Total Exploratory Drilling	Dry Holes per Producer	Success Ratio Pct.
1946	5,759	4.06	19.76%
1947	6,775	3.90	20.34
1948	8,013	4.50	18.25
1949	9,058	3.95	20.20
1950	10,306	4.11	19.54
1951	11,756	4.30	18.86
1952	12,425	4.32	18.78
1953	13,313	3.98	20.13
1954	13,097	3.83	20.68
1955	14,937	3.81	20.78
1956	16,173	4.22	19.13
1957	14,707	4.25	19.11
1958	13,199	4.14	19.46

- Only 13,199 exploratory tests of all types were drilled in the U.S., including 6,950 rank wildcats. But the success ratio was the best since 1955.
- The reduced drilling and the lack of major field discoveries indicates another decline in reserves of liquid hydrocarbons.
- In Canada, exploratory drilling also declined, but reserves of petroleum and natural gas rose sharply to new record levels.

Exploratory drilling in the U.S. last year declined for the second consecutive year. The total of 13,199 tests drilled was the lowest since 1954.

The 10.3% decline in exploratory tests from 1957 was reported by the committee on statistics of exploratory drilling of the American Assn. of Petroleum Geologists, of which B. W. Blanpied (picture) is chairman.

Total footage drilled in 1958 in exploratory tests of all types—new field wildcats, new pool tests, deeper pool tests, and outposts—totaled 61,483,911 ft., down 11.1% from 1957, and the smallest since 1954.

The total exploratory footage drilled in the 49 states averaged out to 4,661 ft. per hole, compared with an average of 4,701 ft. per hole for the 14,707 tests drilled in 1957.

The decline in exploratory drilling last year may well prove to be an indication of the second consecutive decline in U.S. liquid hydrocarbon reserves—even though the exploratory success ratio increased slightly.

The data on reserves of U.S. liquid and gaseous hydrocarbons for 1958 are expected to be reported shortly by the joint committee of the American Petroleum Institute and the American Gas Assn.

The increase in the over-all exploratory success ratio over 1957, however, was probably not enough to offset the decline in the number of exploratory successes in terms of new reserves found.

No major "A" class fields were discovered last year.

The AAPG's definition of an "A" class field is one of 50-million bbl. or more of ultimate reserves.

There was only one discovery in the "B" category—with ultimate reserves of from 25-million to 50-million bbl.; ten in the 10-million-to-25-million-bbl. category, and 90 between 1-million and 10-million bbl.

Last year, 19.46% of the total exploratory holes drilled, with 23.07% of the footage drilled, were successful. In terms of holes drilled, the success ratio was the best since 1955 (table, above).

But it was slightly below the average success ratio of 19.7% for the years 1944 through 1958. In terms of footage, one producer foot was drilled for every 3.33 ft. of dry hole, or slightly better than the 1957 ratio of 1 to 3.39.

B. W. Blanpied, a Gulf Oil Corp. staff geologist at Shreveport, La., is chairman of the Committee on Statistics of Exploratory Drilling of the American Assn. of Petroleum Geologists, which prepared the drilling data.

Of the 13,199 exploratory tests, 2,567 resulted in new fields, new pools, or extensions. Of those successes, 1,745 were oil, 568 were gas, and 254 were condensate wells.

Strict wildcats—the new-field tests that accounted for 52% of all exploratory holes — declined 13.3% from 1957. But the success ratio was the best since 1955.

Of the 6,950 new field tests drilled, 786 were successful, for a ratio of 11.32%. But the number of discoveries was off 9.9% from 1957—the least number of new fields since 1953.

And while the total footage drilled in new-field tests declined 12.4% to 34,202,226 ft. last year, the average depth per hole increased 1% to 4,921 ft., a new record.

The results of the new-field tests last year did not change the basic trends that have existed during recent years. The analysis of wildcat drilling by the AAPG committee shows that:

- Only one hole in every nine has found some oil and gas during the past 15 years—an 11.15% ratio.
- Only one new-field wildcat out of every 43 drilled discovered a field with as much as 1-million bbl. of estimated ultimate reserves—based on fields having a minimum of six years of development history.
- Approximately 98% of all new-field wildcats are failures, in that they

are abandoned as dry or that they discover reserves too small, on the average, to be profitable. (This is also based on fields with at least six years of development history.)

During the nine years from 1944 to 1952, the number of dry holes drilled for each successful new field test increased from 32 in 1944 to 48 in 1952.

"Those are the facts," the committee report notes, "which have forcibly demonstrated the fairness of and the need for the 27½% depletion provision."

Despite the low success percentage of new-field wildcats over the past years, the one bright spot is the generally better results obtained on tests located on technical advice.

The percentage of new field tests located on technical advice has increased from 77% to 83% in the past 15 years. And nearly three times as many new field tests have been successful when located on technical advice.

For 1958 alone, 11.9% of the rank wildcats drilled on technical advice (geology and/or geophysics) were producers, compared with 6.9% success in the case of holes located without technical advice.

In other words, the 1958 new-field wildcats based on technical recommendations were 1.72 times as successful as those drilled without such advice.

Seismographic methods were involved in locating 262 producers.

Exploratory drilling in Canada also declined last year, but reserves of liquid hydrocarbons showed their largest gain (11.7%) in a decade.

Exploratory drilling, AAPG data showed, declined 8.1% from 1957, to 968 tests, of which 213, or 22%, were successful. Footage drilled totaled 4.4-million ft., down 13.7%.

Total reserves of all hydrocarbon liquids rose 381-million bbl. to a new peak of 3,650,000,000 bbl. on Dec. 31, according to the annual report of the Canadian Petroleum Assn.

Reserves of crude alone jumped 292-million bbl. to a new high of 3,166,000,000 bbl. Natural gas liquids increased by 89.4-million bbl. to 484-million bbl.

The substantial increase in Canada's proved reserves was attributed to "increased knowledge" of existing oil pools, according to a Canadian Petroleum Assn. spokesman.

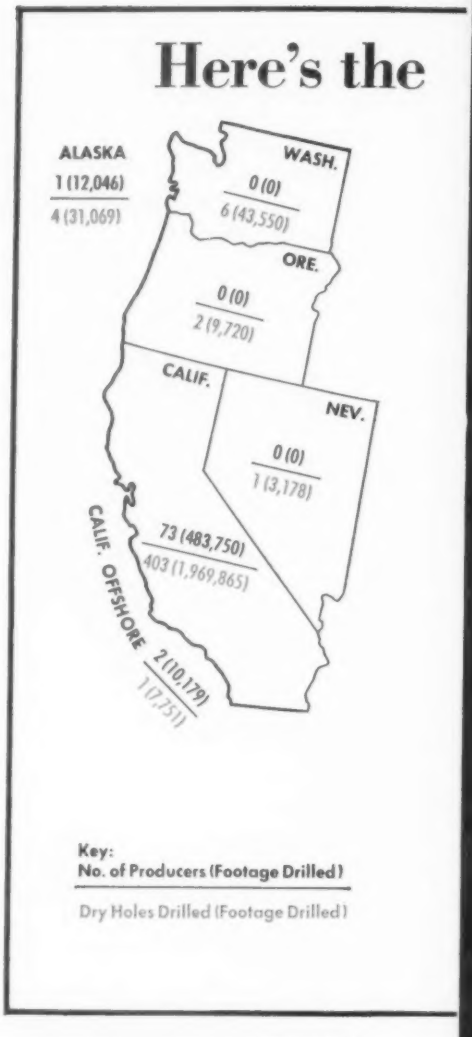
One area where there was a major upward revision in petroleum reserves was the Swan Hills region.

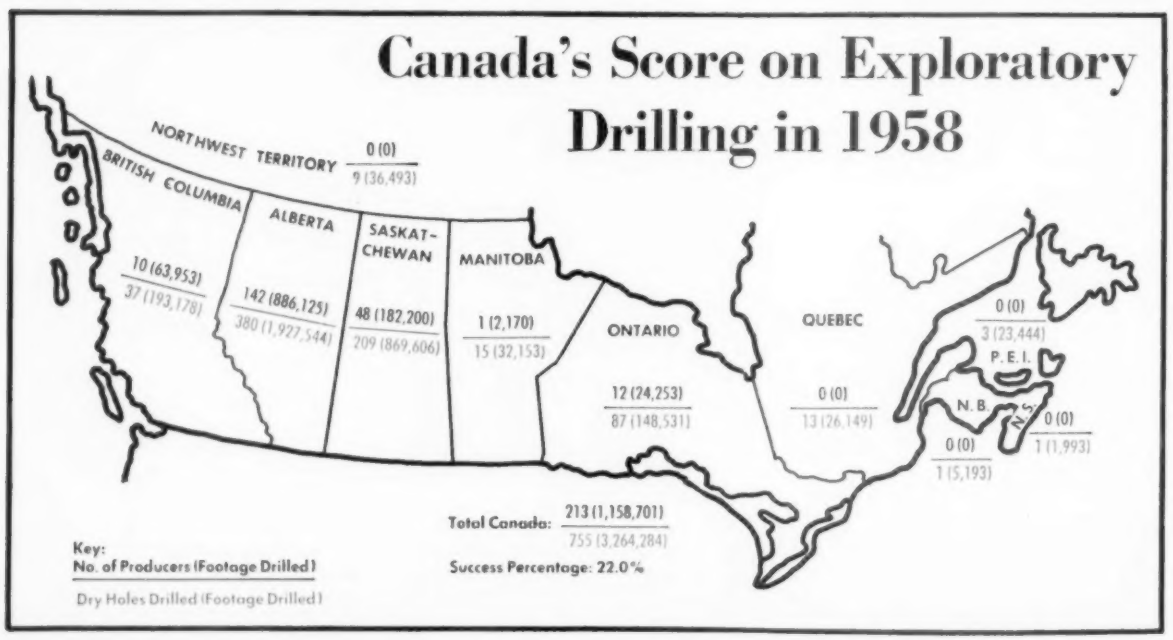
Proved reserves of natural gas in Canada rose to 23.3-trillion cu. ft. at the end of 1958—also a new high, and an increase of 2.6-trillion cu. ft. over 1957.

The increase in gas reserves was attributed to such major discoveries as the Berland River field in the Foothills region of Alberta.

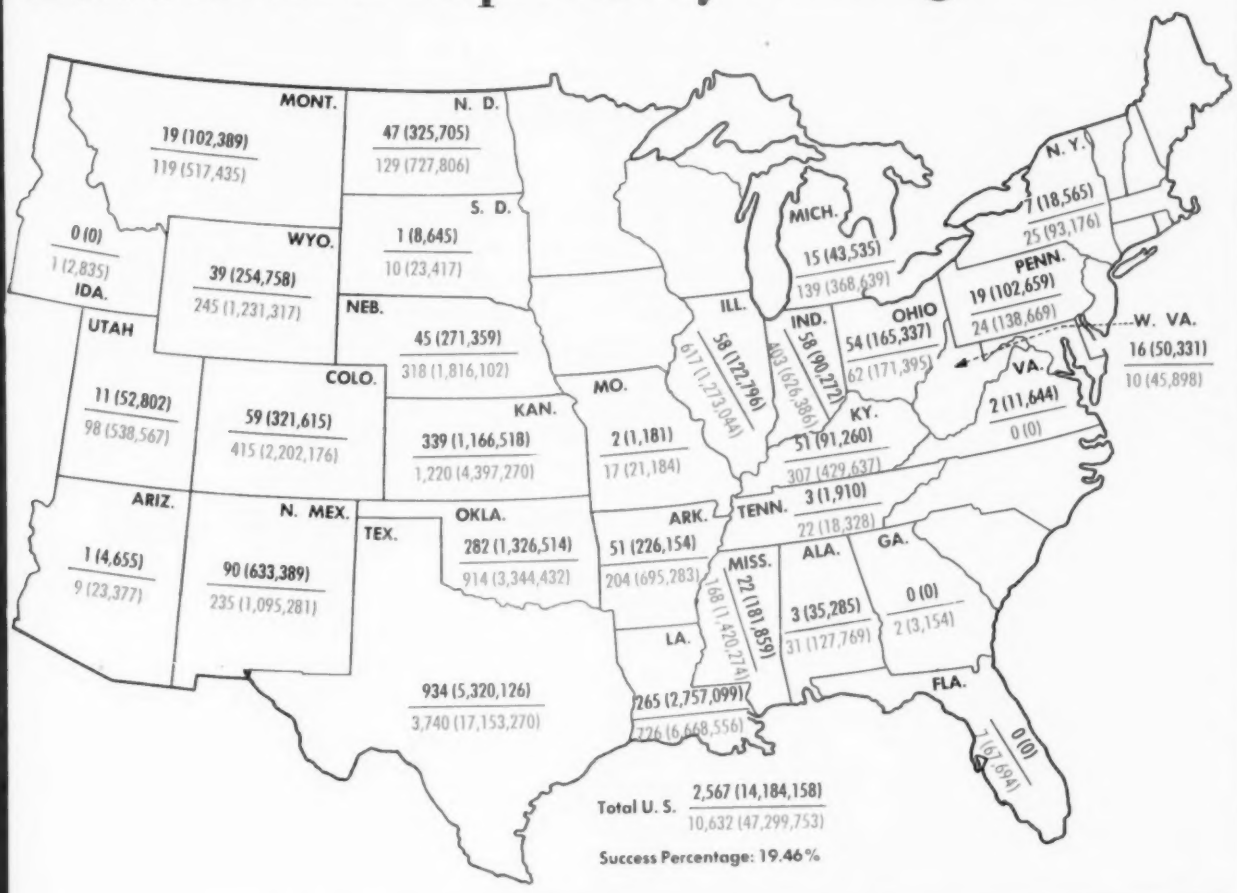
Exploratory drilling in Western Canada totaled 851 holes, of which 201 were producers. The successful tests included 107 oil wells and 94 gas wells.

In Western Canada, 23.6% of the exploratory tests, with 27.05% of the footage drilled, were successful.

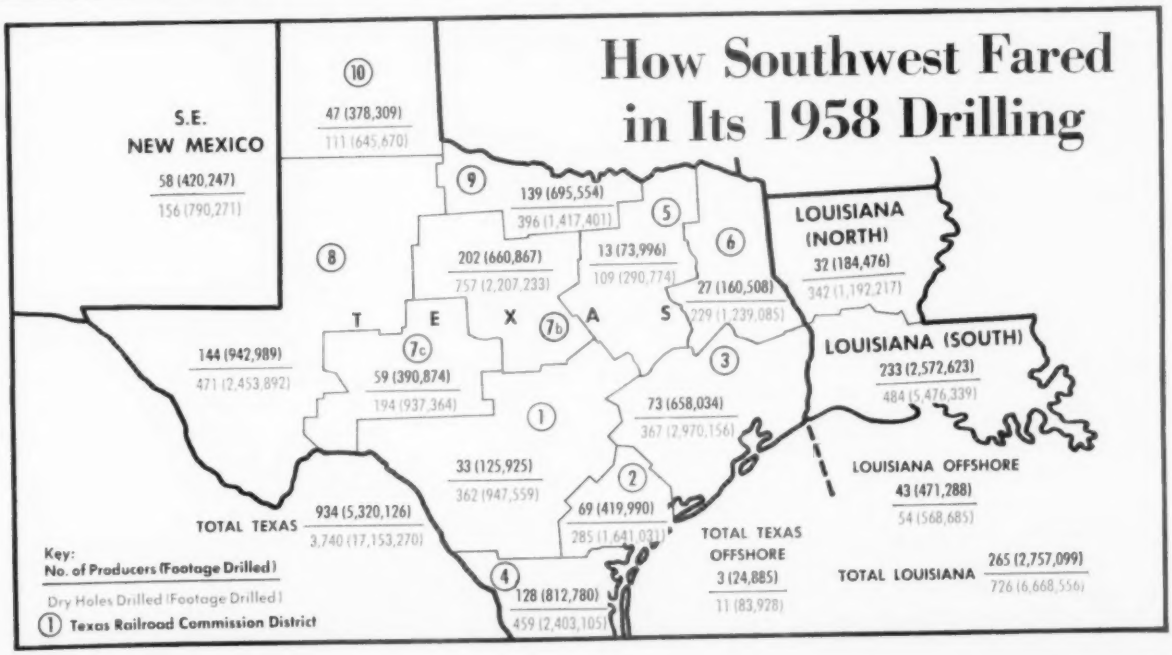




Box Score on Exploratory Drilling in 1958



How Southwest Fared in Its 1958 Drilling



President Outlines Import Plan; Warns Against Any Price Hike

The oil industry this week moved into a new era: one of tight, mandatory controls on imported crude and products, including residual fuel oil used for boiler fuel.

This happened when President Eisenhower declared that violations of the voluntary program had made it necessary to turn to mandatory controls.

His action represented probably the stiffest Federal regulation of the oil industry in peacetime.

The mandatory program replaces a voluntary program started in mid-1957.

Total imports are being cut substantially—from more than 2-million b/d presently to a new level of about 1,470,000 b/d.

Residual imports will be hard hit. Unfinished oils also will drop from recent levels.

The drama of regulation is matched by speculation on the future of the controls and their eventual effect.

EAST OF ROCKIES (Districts I-IV)

- **Imports of crude and unfinished oils must be held to 750,000 b/d, geared to refinery runs. Unfinished oil imports can't exceed 10% of that total.**
- **Finished product imports are to be limited to 1957 levels, with allocations to 1957 importers only.**

WEST OF ROCKIES (District V)

- **Total allocation will be 195,000 b/d, of which 187,000 b/d will be crude and unfinished oils.**

The mandatory program probably will face court tests. There is sentiment in Congress for more legislation.

Most important, the threat of possible price controls now hangs heavy over the industry.

The presidential proclamation stated plainly that future price increases for crude and products would be subject to government review—hinting that price increases must be proved necessary to national security.

What Washington sees is one of the most significant government actions in behalf of a domestic industry in the recent memory of man.

And proponents and opponents of the President's decision look at the new program with some trepidation.

On the one hand, to be sure, domestic producers who have seen their daily allowables shrink because of oversupply, now have the protection they have long wished for.

On the other hand, they face the fact that the Federal Government is in the role of benefactor—and they know a benefactor can turn into a controller.

The veterans in Washington recall that during World War II the oil industry ran with a minimum of Federal regulation, though it paid for it by not getting a price increase. Some wonder whether the "pay the piper" law does not still exist.

Now for details:

East of the Rockies, imports of crude and unfinished products will be limited to about 750,000 b/d. Finished products, not counting residual, will be about 53,000 b/d, the 1957 level. And unfinished oils cannot exceed 10% of the total allocation for crude and unfinished oils.

In the western states, imports will total about 195,000 b/d, mostly crude and unfinished products.

Finished products are expected to account for only about 8,000 b/d.

Residual imports nationwide for use as fuel are expected to be set at about 475,000 b/d.

Imports of crude and unfinished products will be allocated to companies having refinery capacity in the U.S. on the basis of 1958 refinery runs.

Capt. Matthew V. Carson, who will continue as imports administrator under the new Oil Import Administrator in the Interior Dept., is expected to announce details of allocations later this week.

Refiners in Districts I-IV probably will be given allocations on a sliding scale—accumulating from 14% of their first 10,000 b/d of runs down to about 3% of runs in excess of 300,000 b/d.

District V refiners will probably be able to import 25% of runs up to 10,000 b/d, with the cumulative percentages dropping to 4% of runs over 150,000 b/d.

The new import levels, excluding residual, are figured on the basis of 9% of total demand in Districts I-IV.

Within that maximum, finished imports other than residual will be kept at their 1957 levels. And imports of residual for burning will be con-

Price Controls Next?

President Eisenhower warned the oil industry this week against price increases, apparently on either crude or products, unless they are "necessary" for national security.

Any price increases for crude and products now become subject to review by the government.

The President, in his proclamation establishing a mandatory control program for imported petroleum, said:

"The Director of the Office of Civil & Defense Mobilization will keep the entire program under constant surveillance, and will inform the President of any circumstances which in his opinion indicate the need for any further Presidential action.

"In the event price increases occur while the [mandatory] program is in effect, the director is required to determine whether such increases are necessary to accomplish the national security objectives . . ."

fined also to the two-year-ago level.

Allocations for District V are calculated to meet the difference between domestic production and demand. District V imports of all finished products including residual will be limited to the 1957 level.

The new program—at present—makes no concessions to hemispheric producers—Canada or Venezuela—except for extra crude oil allocations to companies in the Great Lakes region depending almost wholly on Canadian supplies.

Refiners in the Great Lakes belt qualify for extra dividends under a special provision in the presidential proclamation which ordered the compulsory program: "Additional imports may be permitted . . . as are necessary to meet the minimum requirements of refiners, and pipeline companies using crude oil directly as fuel, which are not able to obtain sufficient quantities of domestic crude oil by ordinary and continuous means . . ."

Asphalt is included in the compulsory program as a finished product. Asphaltic crude apparently will be given no preferred treatment.

Finished products under control will include liquefied petroleum gas, gasoline, jet fuel, naphtha, fuel oil, lubricating oil, residual fuel oil, and asphalt

The controls on crude and unfinished products became effective this week—Wednesday, Mar. 11.

Current shipments won't be held up, however. The Interior Dept. will deduct from a company's total allocation shipments made before allocations are determined and certificates issued.

The controls on finished products will start Apr. 1.

After that date, any excessive importation of products will be refused entry by officials of the U.S. Bureau of Customs. Each importing company is expected to have its allocation and license for import by Apr. 1.

Only companies that imported finished products in 1957 will be given allocations for products this year—initially. The government is expected to try to work out arrangements through which companies that did not import products in 1957 can receive allocations, if necessary.

No company that took part in the voluntary program will suffer an initial cut of more than 20%.

But the guaranty is expected to be dropped after the first six months of the program's operation. The Justice Dept. objects to any long-range concession to historic importers, for fear the mandatory program might be upset on that ground in any court action.

The Secretary of the Interior will set up a three-man appeal board, which will be empowered to adjust company quotas, if deemed necessary.

An official with the rank of deputy assistant secretary or higher from each of three Departments—Interior, Defense, and Commerce—will comprise the board.

Importers will not be allowed to sell crude brought into the U.S. under the new program. Some trades will be permitted, however.

Importers must either use the crude in their own refineries or trade it for domestic crude that will be used in their own refineries. Companies in the Great Lakes region with special allocations won't be able to trade for domestic crude oil.

Government imports of oil also will be restricted under the mandatory program.

The new Oil Import Administration will give allocations to government agencies importing oil and products, just as companies will receive allocations.

Puerto Rico has been placed in a special category under the new program. Imports of crude and all products, finished and unfinished, will be related to 1958 refinery runs on the island.

The Office of Civil & Defense Mobilization will be the watchdog for the new program, although the Interior Dept. will administer it. President Eisenhower has ordered OCDM Director Leo A. Hoegh to "keep the entire program under constant surveillance," particularly watching prices.

The controls are for an indefinite period. The first allocation period will extend through June 30.

Eisenhower ordered the mandatory program after determining that imports threatened the national security.

He commended companies that complied with the voluntary program, and said it was a "cause for regret" that the "actions of some in refusing to comply" made the mandatory program necessary.

The mandatory program is expected to be challenged both in court and in Congress. If the program is successfully upset in the courts, there will be a hurried drive in Congress to pass some specific legislation limiting imports. And some members of congress—led by Sen. Joseph C. O'Mahoney (D., Wyo.)—are pushing for legislation regardless of the new program's success.

Hemisphere Plan Next?

President Eisenhower hinted that the new mandatory import control plan may be modified later to give more consideration to Canada and Venezuela in the interest of "hemisphere defense."

His proclamation announcing the program closed with this statement:

"The U.S. recognizes, of course, that within the larger sphere of free world security, we, in common with Canada and with the other American republics, have a joint interest in hemisphere defense. Informal conversations with Canada and Venezuela looking toward a coordinated approach to the problem of oil as it relates to this matter of common concern have already begun.

"The U.S. is hopeful that in the course of future conversations agreement can be reached which will take fully into account the interests of all oil producing states."

Automatic Processing Is Nearer

Process automation gets another push toward "commercial reality" with Universal Oil Products Co.'s new computer-controlled pilot plant (page 79).

Three years ago, UOP picked the transistorized digital computer developed by Daystrom, Inc., as the basis for testing process computer control at UOP's Riverside (Ill.) pilot plant. Now, as a result of that work, UOP has been able to "score some successes" in process computer control.

"There's going to be a need for a lot more complex control systems than we've got now," says C. G. Gerhold, assistant to UOP's board chairman. "We have felt that in the long run the control approach would be an essential part of processing."

The biggest opportunity for the system appears to lie in its potential ability to do tasks that would be too

complex for manual control, such as operating a cycle process involving a series of rapid changes, anticipating shifts in catalyst activity, and so on, according to Gerhold.

The UOP pilot-plant computer-control both monitors and controls the process.

It makes continuous analyses of process stream properties, and constantly readjusts the process control system on the basis of instructions programmed into the computer.

A transistorized computer was chosen by David Boyd, UOP's controls expert, because he believed it offered the greatest "on-stream" reliability of any electronic system for control of a process that must operate continuously, 365 days a year.

Gerhold points out that the system controls the entire unit, not just a part of the process.

A lot more testing and evaluation will be needed, however—plus possible changes, if they're indicated—before the system is offered to industry, according to Boyd.

For the past year, he says, the control unit has been reliable enough to show "we are on the right track." But a lot more operating information will be needed before UOP feels it will have anything ready for commercial operation.

The UOP announcement follows on the heels of other fast-breaking developments in computer-control of processing units (PW—Feb.27'59, p28;Jan.9'59,p11).

- Only last month, Sun Oil Co. told the industry that it had teamed up with Genesys Corp., West Coast computer maker, to seek a "new automation system free from preconceptions" at Sun's Marcus Hook (Pa.) refinery.
- In January, The Texas Co. announced that an RW-300 digital computer, made by Thompson-Ramo-Wooldridge Corp., would be in operation this spring for control of a catalytic polymerization plant at Texaco's Port Arthur (Tex.) refinery.
- Monsanto Chemical Co. will install an RW-300 computer to control a chemical process at one of the company's existing manufacturing plants (location not disclosed), which it describes as "already highly instrumented by today's standards."
- Sun plans to use Westinghouse Electric Corp.'s analog-computer Opcon control system on a butane fractionation column.
- Dow Chemical Co. has been using what Westinghouse describes as an "advanced model" of the Opcon system to control a dehydrogenation plant at Midland, Mich.

What's New / IN THE INDUSTRY

Gulf Oil Corp. extended its reduced take of crude to Louisiana this week. The company said it would buy at 65% of the March allowable, reducing its take from 145,000 b/d to 95,000 b/d. Gulf said it was having to prorate its take because its Port Arthur (Tex.) refinery, which went back on stream last week after a 32-day strike, was not up to full operations as yet. Gulf has been prorating its crude purchases in Texas, New Mexico, and Alabama.

•

The second deep test in Pecos County, West Texas—the No. 1-A Montgomery—will be abandoned. The operators, Phillips Petroleum Co. and Sinclair Oil & Gas Co.—decided to abandon the venture after prolonged testing of various intervals. Started in June, 1957, the test was drilled to 23,400 ft., making it the second-deepest hole drilled in Texas. Possible commercial gas production was indicated in the Wolfcamp (Permian) above 10,263 ft., the plugged-back depth. The dry hole is 13 mi. southwest of Phillips' wholly-owned No. 1-EE University, the world's deepest hole, which was abandoned after being drilled to 25,340 ft.

•

Shell and British Petroleum are getting set to resume operations in Egypt, which were halted by United Arab Republic seizure of their properties in November, 1956. Terms of the financial settlement have not been announced, but they reportedly involve payments of nominal sums both by the companies and the UAR to cover seizure claims, back taxes, and royalties. The companies involved include Anglo-Egyptian Oilfields, owned 31% each by Shell and BP, 10% by the UAR, and 28% by the public; two jointly-owned marketing companies; and Shell Chemicals Distributing Co. of Egypt, wholly owned by Shell.

•

A 10-kiloton nuclear explosion in shale reserves could free 15,000 bbl. of oil and 10-million cu. ft. of gas, according to Dr. Willard F. Libby, a member of the Atomic Energy Commission. He said that the Piceance Creek Basin of northwestern Colorado has been suggested as an appropriate area for test of a 10-kiloton device. The explosion, he added, could be set off at a depth of about 970 ft.

•

Argentina is planning to invite bids for exploration work in the central and northern areas of the country. The new bids are in addition to those recently sought for development drilling in proven areas in those regions.

•

Pure Oil Co. has created a foreign operations department to direct overseas exploration and production. Glen R. Harsh, formerly head of foreign exploration and production for Cities Service Co., heads the new department. Staff petroleum engineer under Harsh is Floyd L. Stewart, previously chief petroleum engineer of Hancock Oil Co.

•

Petroleos Mexicanos will "welcome" foreign technicians and drilling contractors to aid it in meeting its demand increases, estimated at from 8% to 12% annually, the recently named director general said in Houston. Pascual Gutierrez Roldan said Pemex reached 300,000 b/d production this month for the first time and is aiming toward a level of 325,000 b/d by the end of 1959. The nationalized company, he said, plans to drill about 470 holes this year.

Talk about getting V-Belt drilling mileage! That's what "Red" Royal's friends – toolpusher Mac Cavasar and his crew—got on their Holmes Drilling Co. rig.

Back in 1951, not satisfied with the brand of belts being used, Mac's company switched to a set of U. S. V-Belts. For the next 5 years, these belts were in almost continuous operation, exposed to all the rigors of Texas climate, constantly being moved from one drilling site to another. And in that time, this one set of belts drilled almost 85 miles of hole—without any special maintenance whatsoever.

Naturally, Mac and drilling superintendent O. R. McLamore are very satisfied with the performance of U. S. V-Belts. They're using them extensively on pumps and several smaller drives, many of which are well on their way to equally impressive records.

"In addition to the quality of the belts," says McLamore, "we also rely on the 'U.S.' sales representative for technical assistance on the drives."

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Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
March 13, 1959

Watch for a Federal Power Commission effort to ignore the "rate base" approach in natural gas pricing. FPC Chairman Jerome K. Kuykendall thinks a recent appeals court decision in a Forest Oil Corp. case may open the door for the commission to avoid worrying about the complex establishment of a base when setting gas rates. So it's likely that Kuykendall and a commission majority might skip the rate base in at least some cases. The Forest Oil decision, in which the Fifth U. S. Circuit Court of Appeals said a rate base was not necessary, collides with a District of Columbia appeals court case, which prompted the rate base theory. The U. S. Supreme Court may have to clear the air.

But FPC still is far from a workable formula for independent producer gas regulation. Even if the rate-base approach is discarded, FPC will only be back where it started. Kuykendall and other members say they dislike their case-by-case method of handing down decisions, but see no alternative in the near future.

•

A Senate committee is inquiring about the Interior Dept.'s contractual arrangements for Alaskan oil development. Interior has recently entered into several contracts with one or more oil companies under which the firms drill exploratory wells. Lands under the contracts are exempt from the department's maximum-lease-acreage limitations. Some members of the Senate Interior Committee have raised questions about the contracts, and especially about the exemptions given the companies. But Interior officials think they can show that their handling of the contracts was valid and necessary for development.

•

Some changes in federal oil and gas leasing rules are being considered. The aim is to clarify and simplify present regulations. Currently, an individual or a company may lease up to 46,080 acres in each of the continental states and 100,000 acres in Alaska. However, because options, unitizations, and other agreements are excepted, the Interior Dept. sometimes has a complicated task of applying the limits.

The planned revision would set a maximum of 300,000 acres for each continental state and 500,000 acres for Alaska—but with none of the exceptions listed above.

•

Chairman Wilbur Mills (D., Ark.) of the House Ways & Means Committee is standing firm against antidepletion members. Mills is sticking by his original plan to hold major hearings later this year on the tax base, with oil and gas depletion included. He wants no major tax legislation until perhaps next year. This became clear last week to several committee members who attempted to bring the issue of the size of the 27.5% depletion rate into a hearing on application of depletion to finished products (page 33). Mills ignored the efforts and will keep the issues separate. Mills has tight committee control and the backing of Speaker Sam Rayburn.

•

Congress' leading backer of natural gas legislation is standing pat for the year. Chairman Oren Harris (D., Ark.) of the House Interstate & Foreign Commerce Committee says he has no plans for pushing his gas bill this year, unless the Administration declares the measure a "must."

Instrument Monitors Corrosion Rates While Equipment Stays on Line

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The *Corrosometer* is its name. It proves the effectiveness of Nalco refinery stream corrosion inhibitors . . . in a hurry. It is the fastest known method of determining corrosion rates in operating equipment; manufactured by Crest Instrument Co. under license from Standard Oil Company (Indiana), and distributed worldwide, by Nalco.

Corrosometer readings are taken quickly and accurately, indoors or out. Instrument leads are attached to probes mounted in corrosion trouble spots. One instrument serves virtually any number of probes.

Coupons, Inspections are Slower

Determining corrosion rates by loss-in-weight methods, using coupons inserted in lines, is a much slower process. Valuable in determining average corrosion rates, it lacks the speed that enables the Corrosometer to reveal immediately any change in corrosion rate caused by process variations. Nalco Representatives, as well as Nalco Corrosion Inhibitor customers and prospects, welcome the speed with which the Corrosometer delivers accurate corrosion rate readings as a real contribution to time and money-saving establishment of good corrosion control practices.

Corrosometer Can Show Day-to-Day Corrosion Rates in System

Readings taken with the Corrosometer show the corrosion rate in the system for a predetermined interval of time. The interval may be as long as desired—or as short as a day or less. Thus checks of Nalco treatment effectiveness, as well as prompt detection of unexpected increases in corrosivity, are practical and accurate with the Corrosometer.

How Corrosometer Works . . .

Utilizing the Kelvin electrical bridge circuit, the Corrosometer compares resistances of two similar probes: one protected from corrosion, the other directly in contact with the liquid or gas in the equipment under test. Corrosion of the unprotected probe increases its electrical resistance, and the difference between probe resistances is directly convertible to corrosion-rate readings of high accuracy.

Retractable probes, for easy replacement without shutting down the system, and probes for high temperature and high pressure systems make the Corrosometer a valuable tool in checking Nalco Results in all types of corrosion-prone equipment.

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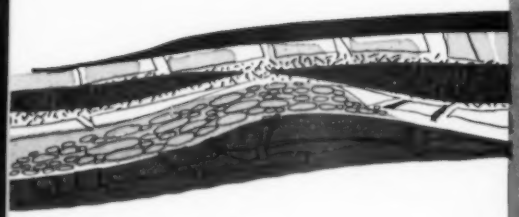

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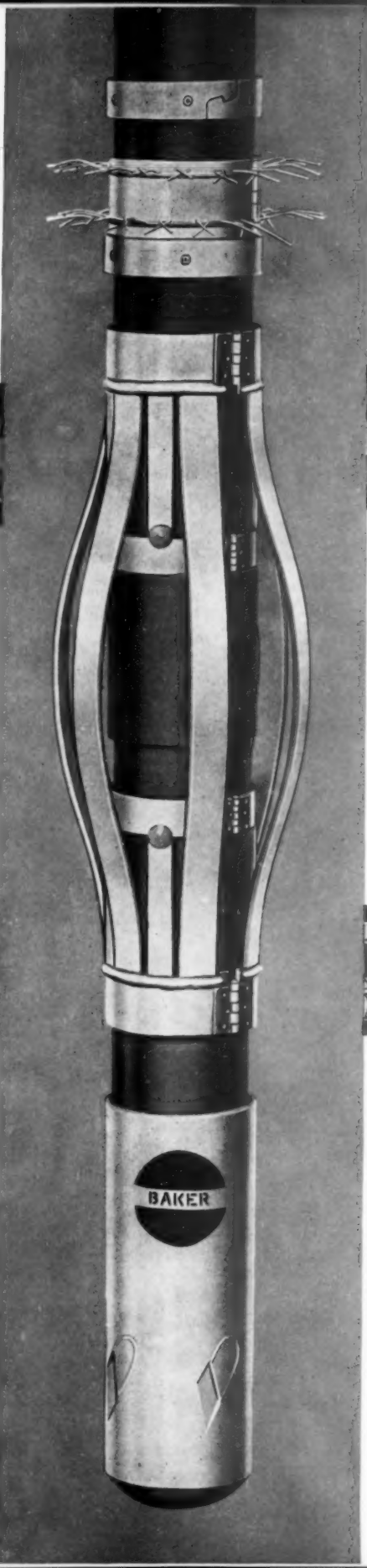
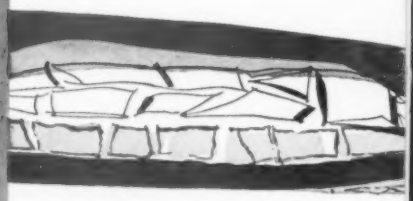


BAKER Wall Scratchers

...remove mud cake *only* from the cementing area. This "controlled scratching" protects productivity. No danger of "balled-up" mud on scratcher wires to plug the annulus with possible pressure surges, and "mudding-off" of production.

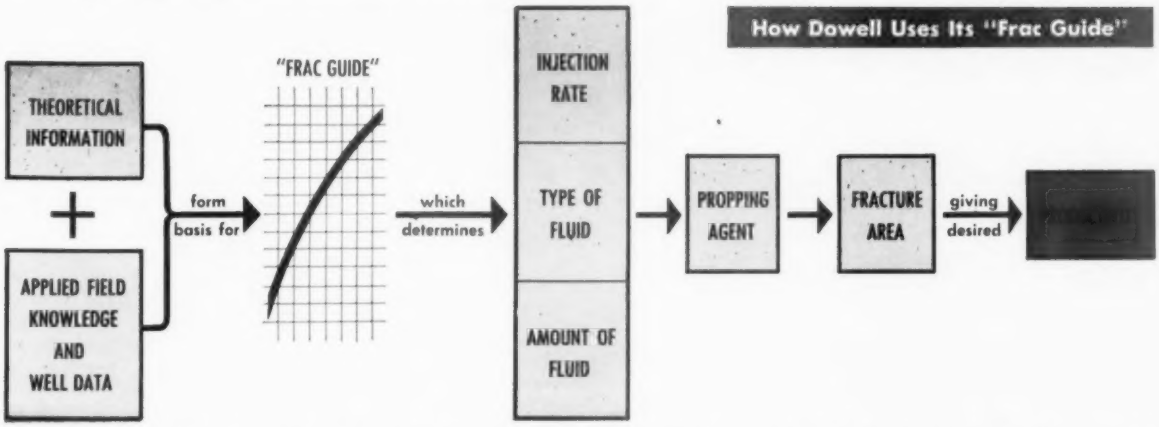


BAKER Casing Centralizers

...assure cementing clearance and do not remove mud cake to plug the annulus, contribute to pressure surges and restrict productivity. The "sled-runner" springs are pre-set to the optimum bowed height, and pass tight spots or dog legs without damage to the centralizer assembly. Their greater centering force maintains ample annular clearance for successful primary cementing.

BAKER Fill-Up Equipment

...saves time in running casing, but does not create pressure surges that restrict productivity. The Variable Valve in Baker DIFFERENTIAL or FLEXIFLOW "Fill-up" Shoes and Collars permits casing to fill from the bottom, and coordinates *rate of fill* with *rate of lowering* to AVOID high-pressure surges. Surface filling is eliminated, danger of stuck pipe is reduced, chances for successful cementing are increased.



VARIOUS FACTORS are involved in planning for optimum production through fracturing. This schematic shows how Dowell's . . .

Guide Makes Frac Jobs More Effective

A new technological development in formation fracturing by Dowell Division of Dow Chemical Co. is helping boost success ratios by more than 50%.

Dowell says its new technique, which "already has increased the success ratio of oilwell fracturing treatments from less than 60% to 97%," is a new approach to an old problem.

The new technique, which will be discussed formally for the first time at a district API meeting in Amarillo, Tex., next month, consolidates and correlates industry-developed theoretical information, reservoir data, fracture-fluid properties, and Dowell's own experience.

The result is a series of charts, graphs, and curves contained in a manual which Dowell refers to as its "Engineered Fracturing Recommendations," or "frac guide."

Benefits, says Dowell, include faster payout, lower lifting costs, higher production rates, fewer sandouts, and greater ultimate recovery.

Once the service company's engineers have in hand such specifics as porosity, permeability, bottomhole pressure, and type of fluid in place, they are ready to put their newly-developed guide to work.

All available reservoir data is applied to curves, based on theoretical and empirical information, contained in the frac guide. This permits Dowell to pick the type and amount of fluid, the injection rate, and the grade and amount of propping agent that will give optimum results.

In applying its frac guide, Dowell's primary concern is that of economics —or, as a Dowell spokesman puts it, "giving the best possible results for the dollar invested."

Company engineers usually start with a desired production figure based on the well's MER (most efficient rate) or established field allowable.

Use of the frac guide, along with previous experience in the area, enables Dowell to predict the optimum fracture area required.

This approach generally results in two or three alternative treatments, which can be achieved by varying fluid coefficient, injection rate, and type and amount of fluid.

The criterion, then, is selection of the treatment that can be performed most economically—and this is the one that Dowell recommends to the operator.

Some highly significant factors concerning equipment and materials already have been uncovered by Dowell in its use of the guide.

Although no alteration in type or design of field equipment is indicated, Dowell has found that it can get just as good results in many wells with fewer pumpers and blenders on the job. The huge jobs performed in recent years may very well become a thing of the past, Dowell believes.

The guide also is serving to point up the fact that a greater amount of sand, in a greater variety of grades (grain size), is one answer to high-capacity fractures. This brings up the likelihood of increased sand storage capacity and more sand trucks.

In several areas, Dowell has found that the fluid and additives used over the years are not the best, even though their use has become more or less standard procedure. Often, a less

FRACTURING JOB is carried out by Dowell personnel after "frac guide" has been prepared and evaluated. Pumpers pictured are being operated by remote control.

expensive agent has been found to give better results.

Dowell stresses that its new frac guide isn't a "cure-all" for fracturing problems, and isn't meant to be.

"What it does," a Dowell spokesman told PETROLEUM WEEK, "is enable us to program a well treatment based on sound engineering principles. We've taken a lot of the hit-or-miss proposition out of formation fracturing."

The guide can't be applied in undeveloped areas. Basic reservoir data is a must, and well behavior following previous fracturing treatments is highly-desired information.

The guide has proved its greatest adaptability in older producing areas, where wells are being treated for the second or third time.

Dowell's recent experience in one Permian Basin area illustrates the manner in which the guide is proving its worth. A Dowell official says:

"In an Ector County (West Texas) field, 20,000 gal. of refined oil and 30,000 lb. of sand had been the most common treatment used in initial fracturing of a sandy Grayburg (Permian) dolomite.

"These treatments showed good results in increased productivity, and the decline curve was as good as anticipated.

"Several years following the initial treatment, production had declined to the point where a second fracturing operation was considered advantageous. Dowell came back and retreated with 40,000 gal. of refined oil plus 60,000 lb. of sand. This resulted in little or no increase in production.

"Evaluating the first and second treatments by use of its guide, Dowell found that the second treatment actually had created very little additional reservoir penetration. Therefore, a third job—based on the guide—was designed to give a great increase in the fracture area and in reservoir penetration.

"The answer was found in a fracture treatment that utilized 200,000 gal. of water and 200,000 lb. of sand. The resultant production increase was greater than that shown from the initial treatment. The wells now have been producing 4½ months with no significant decline."

Since last October, when the frac guide was put into widespread use, it has been employed in over 600 well treatments.

The guide was developed in Dowell's West Texas (Midland) district; work on it began about a year ago. A majority of the jobs using the guide have been performed in the Permian Basin area, although good results also have been observed in the Four Corners area, Canada, Kansas, eastern Oklahoma, the Anadarko Basin, North Texas, and the Ark-La-Tex area. It is now being introduced in Mississippi, Alabama, and the Illinois Basin.

The frac guide, Dowell says, was a natural outgrowth of a recognized need to predict more adequately the effectiveness of formation fracturing prior to its actual use. A Dowell spokesman explains it this way:

"Stimulation practices developed over the years have all had one primary objective: to increase wellbore area.

"In fracturing—the most recent and most effective of these methods—the area is increased by initiating and propping open natural or induced fissures radiating outward from the borehole itself.

"But one shortcoming of fracturing has been the service companies' inability to determine accurately, in advance of a treatment, how much new area would be opened up and, therefore, what could be expected in the way of increased yield."

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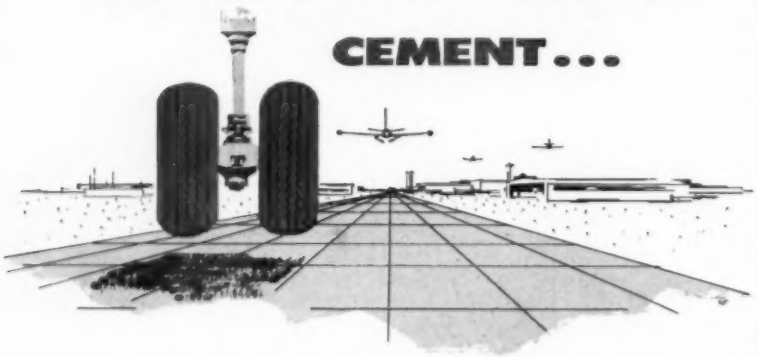

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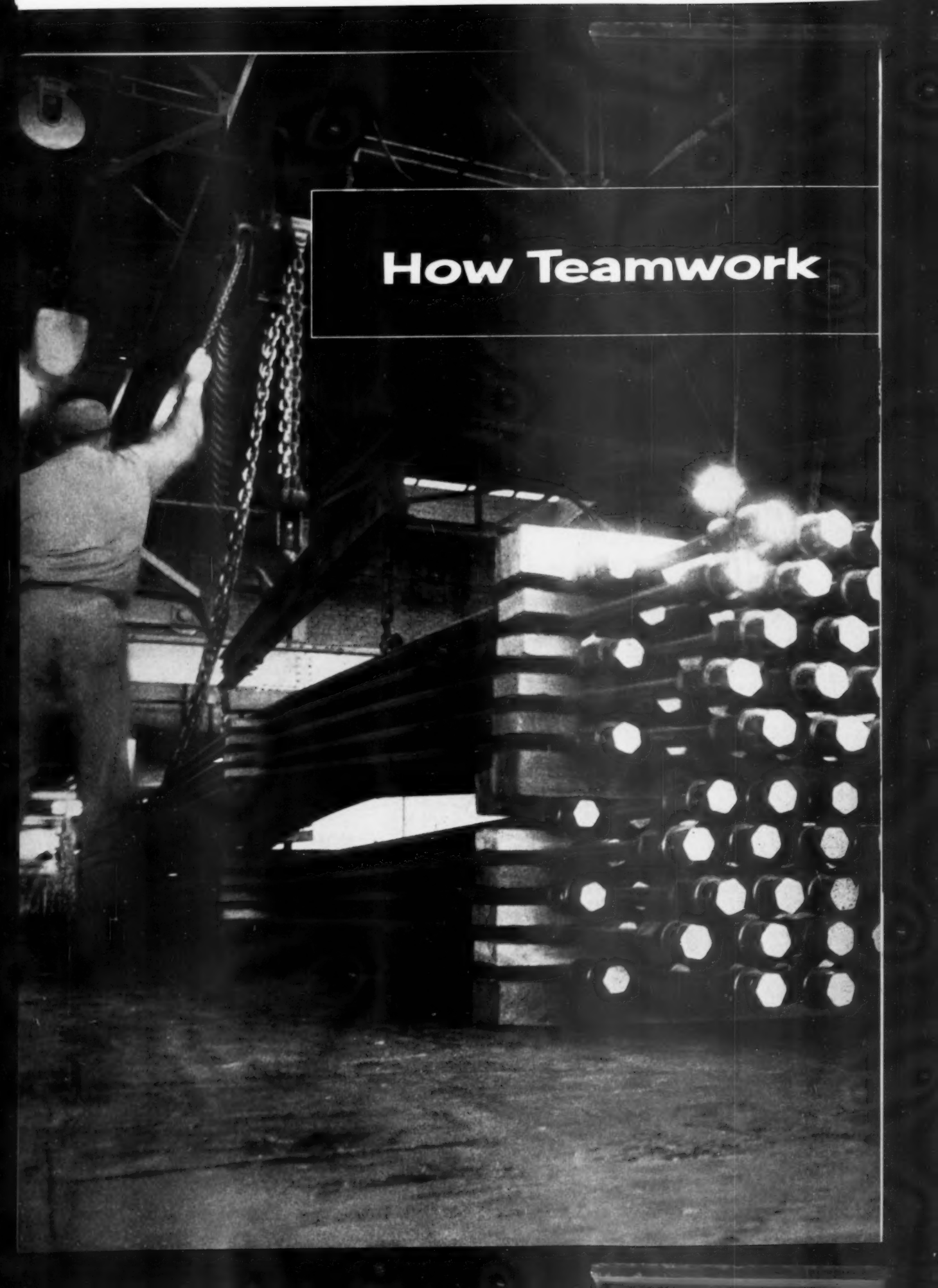
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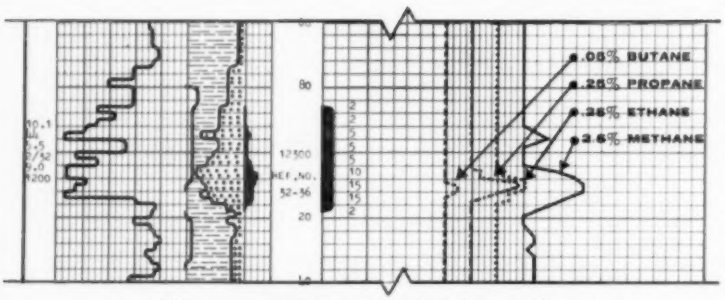

High propane content of gas in drilling mud is the distinguishing marker of oil producing zones.

A Mississippi wildcat recently completed in an unexplored area, had forty-five shows. One of them, identified as commercially productive by Hycalog gas CHRONOFRAC, has been confirmed by production tests at nearly 200 barrels per day.

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Pilot Fireflood Begun in Texas

Preliminary operations have begun on the first thermal recovery project in West Central Texas. It is only the second such project in the state.

The new operation is in the depleted Coleman County Regular field, 20 mi. northeast of Coleman.

The Coleman pilot project is on a 3.7-acre plot on the E. E. Knight lease, near the Brown County line.

John DeFord, of Abilene, as trustee, is operator. The project is under the engineering direction of Tejas Petroleum Engineers, Dallas, which also is directing a similar project in the Camp Hill area of Anderson County, East Texas (PW—Dec.19'58,p23).

Lamret Oil & Gas Corp., of Abilene, also has applied for a thermal recovery project, on its A. H. Conner lease, Brown County, West Central Texas. The Railroad Commission has set a hearing for Apr. 3 on the application.

Air injection has been initiated in a conventional five-spot pattern. It'll take two to three months, however, before success or failure of the fireflood is indicated.

Air was pumped into the area's shallow Amerada sand, at the 160-ft. level, under an initial pressure of 130 psi. Both volume and pressure will be increased for about a week once ignition occurs.

An electrical heating coil will be lowered to the oil zone to ignite the air and start the burning process. Once this is established, combustion will be continued by further injection of compressed air.

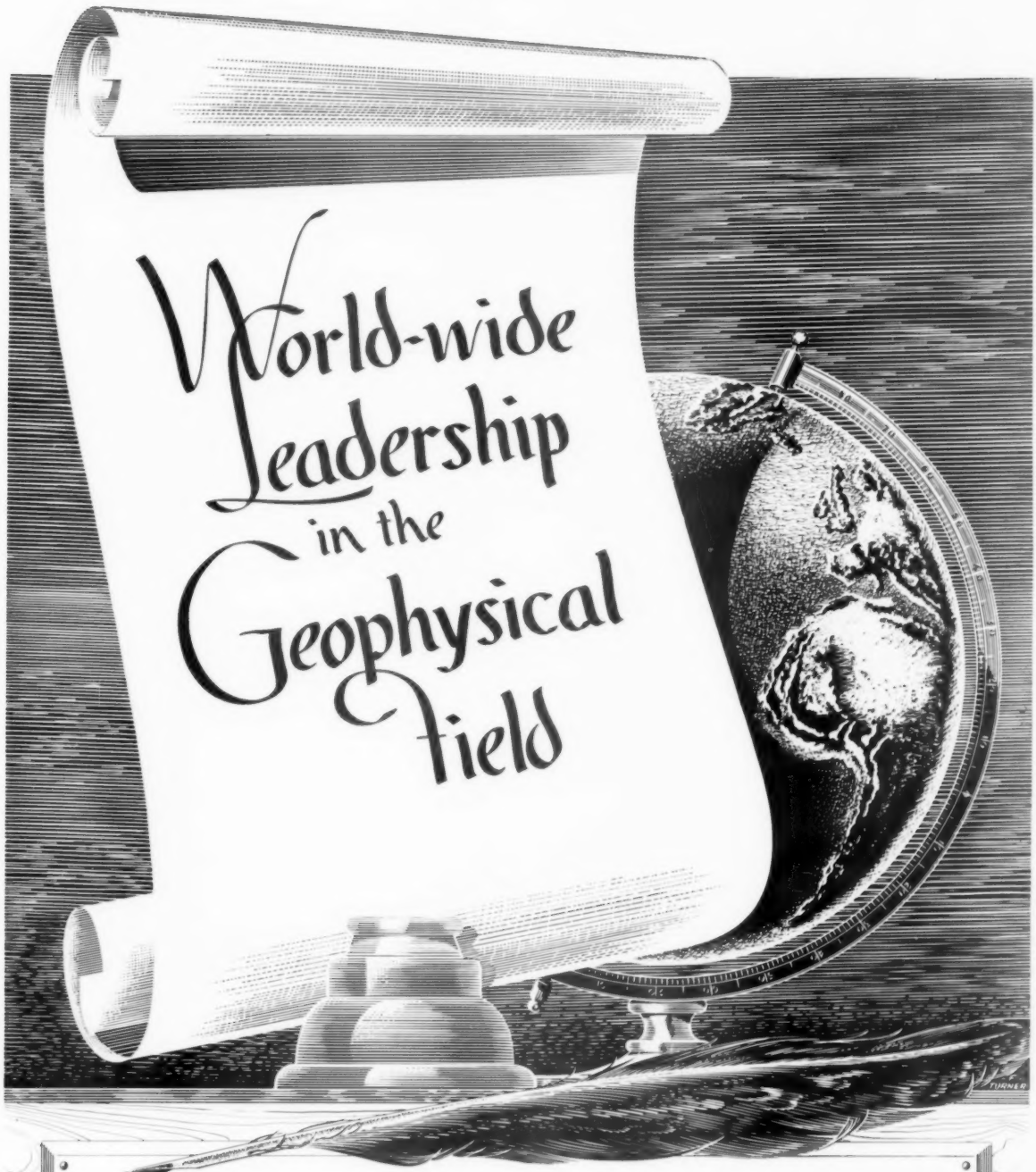
Only one injection well and four producers are being used during the initial stages.

Tejas engineers estimate that the depleted pool still holds about 60,000 bbl. of oil. The hopes are that at least half of this crude will be recovered by the fireflood.

It is believed that once the area is fired, the front will move at a fairly rapid pace because of the 32-gravity oil present in the reservoir.

Firefloods are customarily associated with low-gravity crude reservoirs. This is the case, for instance, with the thermal project now under way in the old Camp Hill Carrizo sand field in Anderson County, where the oil is from 19- to 20-gravity.

This project was fired about two weeks ago, but here, too, it will be several months before success or failure can be determined.



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New Burners Help Lift Heavy Crude

Gas- or propane-fired bottom-hole burners are the latest development in use of heat to stimulate production of low-gravity oil in California.

Eight of the new-style heaters have been installed in California—six in Huntington Beach Field, Orange County, and two in Kern County.

One of the heaters is also being tested in Venezuela.

The new bottom-hole burners can be installed or pulled without pulling the tubing.

The heater is run on a single string of 1¼-in. pipe, which can be hung independent of the tubing.

A mixture of gas and air is pumped down the 1¼-in. pipe and ignited in a fire tube at the bottom of the well.

The burner element is 4½ ft. long and 1.9 in. in diameter. A 30-ft. joint of 1¼-in. pipe is hung on the bottom of the burner to provide additional heating area.

A spring-loaded foot valve to allow the exhaust gases to escape into the well bore is at the bottom of the 30-ft. joint of heater pipe.

The ignition system consists of a combination orifice and igniter connected to a 6-ft. sinker bar.

The sinker bar is run on a single conductor 14-gauge wire line inside the 1¼-in. pipe. The orifice and igniter drops into a seat in the top of the combustion chamber.

To fire the heater, a metered flow of gas—1 part gas and 10.4 parts air, or 1 part propane and 24.5 parts air—is pumped down the 1¼-in. pipe at a pressure great enough to overcome the static head in the well.

After enough time has elapsed for the mixture to start to exhaust through the foot valve, the igniter is actuated from a power source at the surface.

The heat can be controlled by the rate at which the mixture is pumped through the burner. Heat ranging from 10,000 to 100,000 Btu. per hour can be applied.

A major advantage reportedly offered through use of the new heater is a saving in fuel costs.

An average heater of this new type, for example, might use about 1,080 cf/d of gas, for a cost of 5¼¢ per day. With propane, the same well would require about 11.4 gal., costing about $1.59 per day.

Typical operating cost for a conventional type heater using public utility gas for fuel is about $2.50 per day, depending, of course, on the depth of the well and the amount of fluid being pumped.

If propane is used, cost increases to about $7.25.

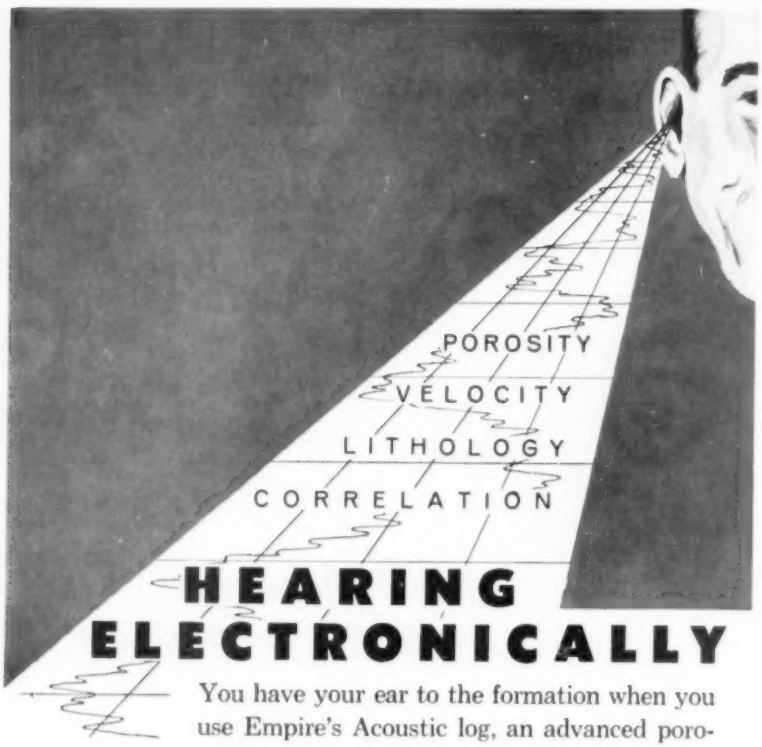
The low cost is attributed to the fact that the new heaters require less fuel than conventional types. One reason: There is no heat loss, because the heat is generated where it is needed rather than on the surface.

In most cases where gas is not available, it has been found that the heater can be started on propane, and, after a few days of heating, the well itself will produce enough gas to supply about 50% of the fuel requirements.

Experience to date indicates that the new heaters increase production about as much as do circulator-type heaters.

The installation cost of the new heaters for a well 1,000 ft. deep is about $3,000.

The heaters are being manufactured by Fran-Well Heater Co., Bakersfield. Patents for the burner are held by California Research Corp.



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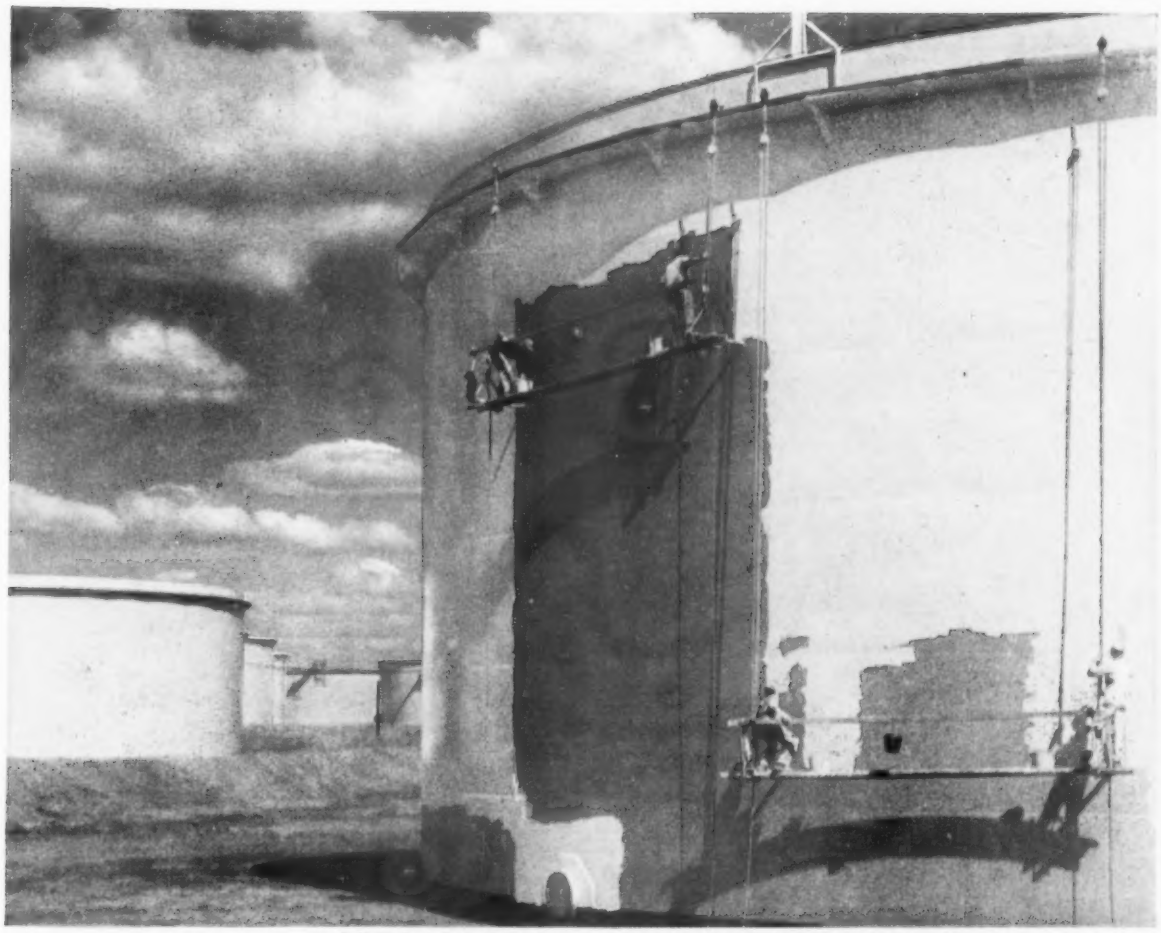

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Congressmen Open Fight on Depletion

The depletion fight in Congress has begun sooner than expected.

The Treasury Dept. proposal to redefine the depletion law with respect to minerals (PW—Mar.6'59, p10) triggered the fight on the entire depletion question.

The Treasury Dept. had asked Congress to clarify the tax laws to limit depletion to the value of the raw products only, and not on the value of finished or semifinished products, as some court rulings have permitted.

Discussion on the proposal as it affects nonpetroleum minerals began in the House Ways & Means Committee last week.

A second hearing on the proposal, as applicable to the oil industry, has been scheduled for a future date.

Rep. Wilbur Mills (D., Ark.), chairman of the House committee, had planned to limit the hearing to the Treasury proposal only, and to avoid the issue of rates.

But what was expected to be a routine hearing on procedure suddenly became a new battle ground for attacks on the entire depletion question.

Key House leaders, however, are reported to have sufficient control over the hearing to restrict any committee decision to the Treasury's redefinition proposal.

Depletion foes argue that rates cannot be ignored in any discussion of depletion.

Rep. Thomas Curtis (R., Mo.), a past critic of 27.5% depletion, opened the rate question by asking, "How can we consider the cut-off point for applying depletion without reviewing the percentage too?"

He was joined by Rep. Howard Baker (R., Tenn.), who insisted the committee go into the rate question, and by Rep. James Utt (R., Calif.), who said rates and cut-off points cannot be divorced.

The government's bid for clarifying legislation on the applicable extent of depletion was triggered by a recent court decision, which appears to broaden application of the tax law.

In December, a U.S. District Court in Austin, Tex., ruled that La Gloria Oil & Gas Co. was entitled to figure depletion on gross income from the sale of its petroleum products.

La Gloria sought the depletion on gross income from the sale of products from its wet-gas cycling plant.

The Internal Revenue Service objected to this application of depletion, but lost the case. The government, however, is appealing the decision to the Fifth Circuit Court of Appeals.

The court decision, if allowed to stand, would mean a loss in tax revenue by the government, since it would allow deductions to be made on products having higher value than the wellhead value of the crude or gas from which they were derived.

The proposed legislation provides that gross income applicable to depletion be the amount attributable to oil and gas before transportation from the vicinity of the well, and before conversion beyond the crude state.

This converison is defined as any processing other than that necessary to bring the crude up to pipeline standards, and certain separating processes for natural gas.

The proposed legislation also would define just what oil and gas processes would be allowable when determining gross income for depletion purposes.

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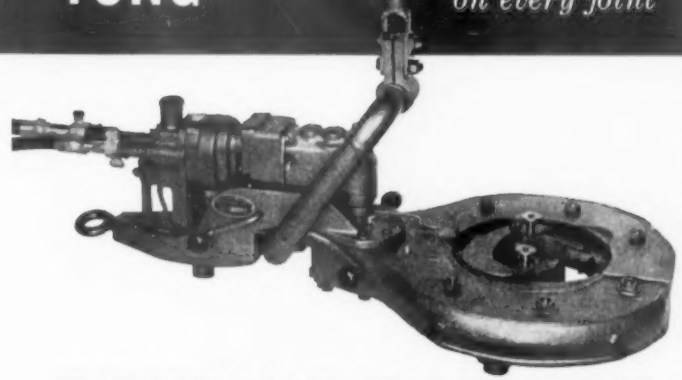

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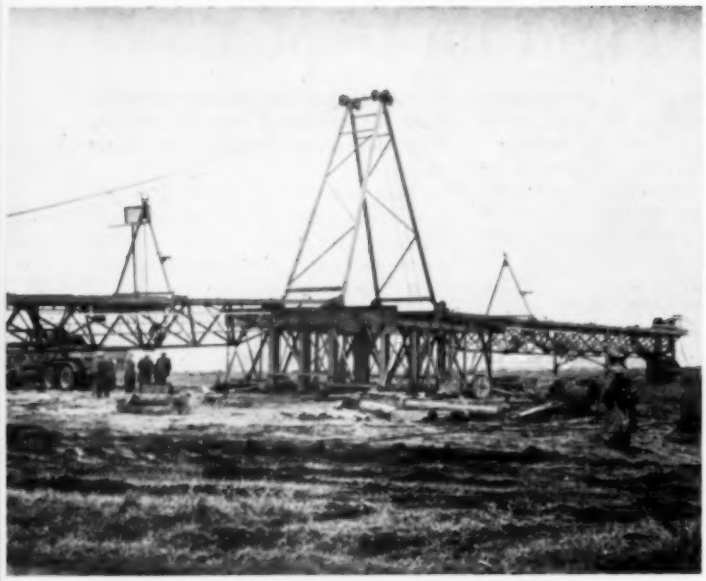


1 The mast columns are ready to be pulled upright by cables that run through the erection trunnion on the base plate.

2 Up go the sections as trucks pull cables running from the top of the columns through the trunnion.

Austrian Mast Is Raised In Two Sections

4 One truck slows down as its side of the mast is attached to the trunnion, while the other truck pulls its side into position.

This unique drilling mast, employing twin columns that are raised simultaneously, is now in use in Austria.

Built by the Austrian firm, Mannesmann-Trauzl A.G., a mast similar to that shown in the pictures is being used to drill on a location about 35 mi. north of Vienna.

The highly portable mast has a depth capability of 3,500 meters (about 11,500 ft.). The crown stands 125 ft. above the ground, and has a weight capacity of 285 tons.

The five-part mast consists of two lower column sections, a base plate, and two telescope-type columns.

Two trucks, each equipped with an 8-ton hoist, carry the lower column sections, which hinge to the base plate and the telescope columns.

The base plate and telescope columns are pulled on trailers by full-track tractors.

The column sections are assembled at the drilling site, then elevated and joined—first at the middle, then at the top.

The twin columns are raised by an elevated pulley system that is powered by the hoists on the two trucks. This pulls the columns upward, with each column acting as a counterbalance for the other.

The cables pulling the columns together run through the erection trunnion located between the columns.

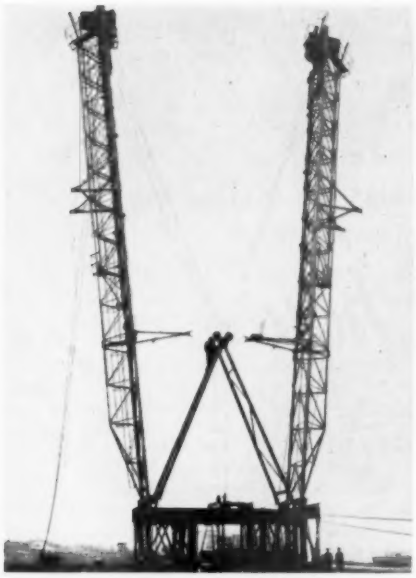
Here is how, specifically, the columns are raised:

Each of the two lower sections is hinged to the base plate and to the telescope sections of the columns. The cables running through the trunnion are wound on a divided cable drum located on the base plate.

Uniform raising of the two columns is controlled by the divided drum, which has separate spooling areas for each column's cable.

The horizontal arms reaching out from the columns attach to the erection trunnion to steady the operation.

After the upper sections have been



3 Braces extending from each section fasten to the trunnion to steady the operation.

5 Tops of the sections are joined, and workers start removing the braces and trunnion.

raised into place, and the crown block has been joined, the trunnion is removed, and the bracing arms are folded flat against the column sides.

Perfect balance during elevation cannot be achieved because of a slight weight difference between the two columns.

One column has three crown pulleys, the other has two crown pulleys and one cable drum.

During the elevating process, one column always reaches the steadying attachment before the other. At such time, the one column is secured; the other is pulled into position by utilizing its half of the divided cable drum.

6 With the mast completely assembled, the rig is ready for drilling. It's designed to go to 11,500 ft., and stands 125 ft. high.

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7⅝" 29.70# N-80	103**	28	07	3.6	2	Below 13,000′
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7" 26# N-80	202***	18	48	10.6	2	Below 14,000′

*Includes milling bottom half of safety joint and cross over bushing.
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What's New / IN PRODUCTION

Sept. 1 is the deadline for companies to start the massive unitized repressuring program for the Wilmington field, Long Beach, Calif.

The order, which went into effect last week, provides for compulsory unitization unless the producers voluntarily take action before the deadline.

Present plans call for injection of more than 900,000 b/d of ocean water into four zones, at rates calculated to restore pressures over a five-year period. Total estimated cost: $60 million (PW—Jan.16'59,p23).

•

The tremendous growth of oil and gas production in British Columbia is underscored by a report issued last week by the provincial Dept. of Mines.

The report shows that dollar value of such production increased 400% last year. Crude production totaled 512,510 bbl., compared with 345,320 bbl. in 1957. Natural gas production soared to 64-billion cu. ft. in 1958, compared with 8.5-billion cu. ft. in 1957.

The report adds that there were 28 producing oil wells and 39 more capable of production at yearend, compared with 15 and 22, respectively, in 1957.

•

The South Dakota Oil & Gas Commission has set 160-acre spacing for development of Buffalo field, Harding County.

The commission has recommended a review of the spacing ruling at the end of a year. The commission also defined the field beyond present producing limits. The redefinition takes in the discovery completed last year by A. L. Schlaijker and Herb Clarkson, 3 mi. west of established production at the time of its completion.

•

Continental Oil Co. has leased exploration and development rights on two film studio properties in Culver City, Calif.

The company acquired a 55-acre lease from Desilu Productions, Inc., and an 88-acre lease from Metro-Goldwyn-Mayer.

Continental will begin an exploratory test on the MGM properties within 90 days after drilling permits have been approved by Culver City.

The company now has 800 acres under lease in Culver City, involving more than 2,300 leases on 3,000 residential and commercial lots.

•

The lack-lustre tempo of petroleum industry activity is seen as a major contributing factor to depressed enrollment at Kilgore (Tex.) College's "School of Production Technology."

Only 24 men are presently attending the eighth such session at Kilgore. Classes usually have had about 32 enrollees for the six-week course, which deals with all major aspects of production technology.

Whether the trend will continue may be answered when Texas Technological College, in Lubbock, holds its sixth annual West Texas Oil Lifting Short Course, Apr. 23-24.

•

Five producing oil wells in Revilo field, Scurry County, West Texas, have been acquired by D. W. Varel, Dallas, from W. K. Davis, Houston.

The wells, on two leases in section 300, block 97, H&TC survey, have a daily production of about 100 b/d. Consideration was not disclosed.

•

A total of 10,740 acres of North Dakota state lands will be offered for oil and gas leasing at competitive bidding in Bismarck Mar. 31.

The offering by the Bank of North Dakota, as trustee, includes 117 tracts in 13 counties. The largest number of tracts are in Mountrail and Dunn Counties.

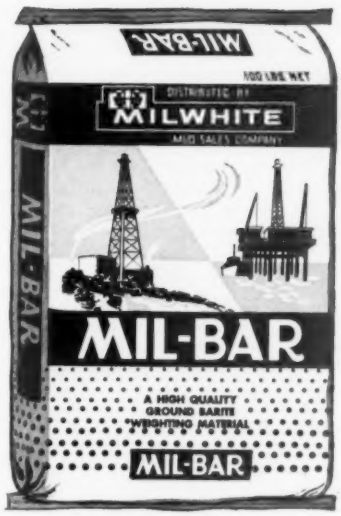
•

Seminole Oil & Gas Corp. has purchased "substantial working interests" in about 6,000 acres in central Kentucky.

The leases lie astride the Cincinnati Arch in Taylor, Green, Laurel, Allen, and Simpson Countries.

•

A course designed to train assistants so that geologists and petroleum engineers will be free to devote efforts to more exacting tasks will be offered next fall by the Provincial



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Institute of Technology & Art, in Calgary, Alberta.

The two-year training course will be divided into two sections: one to train assistants for geologists; the other to turn out assistants for petroleum engineers.

An advisory committee of major oil companies, aided by the Canadian Petroleum Assn., was formed to aid in creation of the course.

•

Magcobar Drilling Mud Co. is building a new plant in central Alberta in an effort to keep up with the growing Canadian need for bentonite.

The $400,000 plant is under construction at Rosalind, 25 mi. southeast of Camrose.

Magcobar is a Calgary-based branch of Magnet Cove Barium Corp., one of the Dresser Industries. It holds between 3,000 and 4,000 acres of bentonite leases about 10 mi. from the plant site.

Although no capacity figures were released, the plant is said to be capable of fulfilling all of Canada's bentonite needs, estimated at about 25,000 tons annually.

•

The newly-christened drilling barge, "Rome," has been moved to its first location in Lafourche Parish, near Larose, La.

Built by Levingston Shipbuilding Co. for Bay Drilling Corp., the barge is designed for drilling to depths of more than 20,000 ft. The Rome is a slotted-hull type steel submersible barge, 190 ft. long, 50 ft. wide, with a 14 ft. hull.

•

Four waterflood projects were approved last week by the Texas Railroad Commission.

- In Archer County, flooding of Reno (Strawn 3,700 ft.) field by Tennessee Gas Transmission is expected to boost production by 130,000 bbl.
- In Gray County, Skelly Oil Co. estimates that 455,000 bbl. more oil can be lifted from the Brown Dolomite reservoir, Panhandle field.
- In Taylor County, flooding of the Dothan sand reservoir is expected by Hovgard & Fitzgerald to raise production by 480,000 bbl.
- Trice Production Co. will flood the Dyson sand reservoir, Wilbarger County, but no estimate was given as to probable results.

•

Volume IV of "Reference Report on Certain Oil and Gas Fields" in the Ark-La-Tex area has been published by the Shreveport Geological Society. The 186-page volume includes well logs, isopach and structure maps, discovery data, and other related information.

•

Engineering

A new portable magnetic recording and playback system, weighing only 60 lb., has been developed by Techno Instrument Co., Los Angeles.

The TI-551 system is designed primarily for use in seismic exploration. It provides 24 data channels, one timing channel, and two auxiliary channels. The fully-transistorized unit is contained in an aluminum case for hand-carrying or truck mounting.

•

A new-type rock bit, in which the rows of teeth are so arranged as to cover the entire hole bottom being drilled, has been developed by Oil Tool Mfg. Co., Tonkawa, Okla.

The Type WBS bit is designed to drill extremely hard formations. The cones are offset 2 degrees from apex to create a chipping action on the hole bottom at all times. Weights of 4,000-6,000 psi. can be applied at rotary speeds of 35 rpm. or less.

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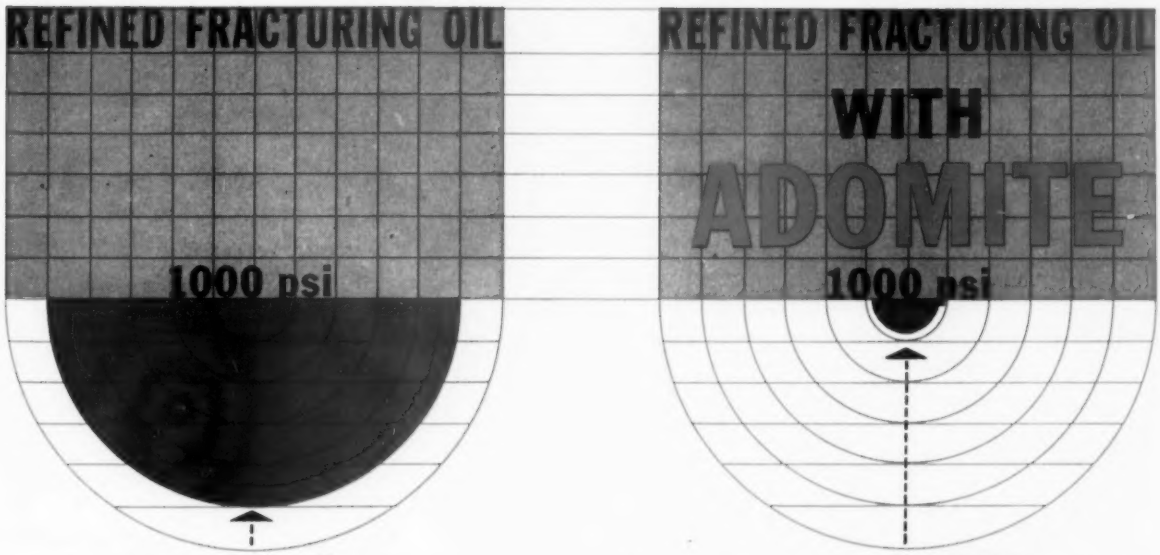

250 CC fluid loss in **2** minutes*

40.5 CC fluid loss in **30** minutes*

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	Fluid Loss cc/30 Min. 100 psi	1000 psi
Crude Oil + Adomite.....	8.8	19.6
Gelled Crude Oil	22.0	Inf.
Gelled Crude Oil + Adomite..	6.0	16.5
Refined Frac. Oil.....	21.0	250/2 min*
Refined Frac. Oil + Adomite..	18.0	40.5*

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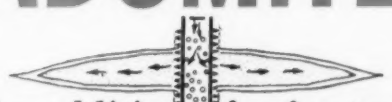

...the additive for fracturing!

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Drilling Highlights

Oklahoma—Odessa Natural Gasoline Co. No. 1 Potter Unit, section 12-19n-22w, Ellis County, was completed for 155 b/d of oil on the pump through perforations at 7,980-94 ft. in the Cottage Grove. The discovery is 12 mi. southeast of East Goodwin pool.

In McClain County, Weimer & Fitzhugh No. 1 Hester, section 23-6n-4w, flowed 180 bbl. of oil in 6 hours through ¾-in. choke and perforations at 11,852-63 ft. and 11,884-904 ft. in the First Bromide. The test is 3 mi. west of East Criner field.

North Texas—Taubert & Steed No. 1 Petrex, block 64, ANTCL survey, Archer County, was completed for 312 b/d of 41.2-gravity oil through 16/64-in. choke and perforations at 5,227-37 ft. and 5,254-64 ft. The Caddo (Pennsylvanian) discovery is 2 mi. northeast of Chalk Hill field.

Kansas—Phillips Petroleum Co. No. 1 Wilkins, section 16-2s-37w, Cheyenne County, was completed on the pump for 83 b/d of oil plus 9 b/d of water through perforations in the Maramaton at 4,743-50 ft. The discovery is 11 mi. southeast of Judy field.

Also in Cheyenne County, R. G. Lawton No. 1 Rueb, section 13-3s-42w, was completed on the pump for 60 b/d of oil and 62 b/d of water through perforations at 4,537-42 ft. in the Lansing-Kansas City. The wildcat is 35 mi. west of Brumm field.

Confidential production research in the most completely mechanized laboratories in the oil industry, directed toward greater percentage of recovery in each individual field is the pledge of Petroleum Technologists, Inc. Only after thorough investigation, recommended procedures are set up and results obtained before a custom program is begun. These tests include PVT analysis, gas drive, waterflood, miscible phase drive, condensing phase drive and auxiliary tests and services. Accurate, fast, dependable results assure you greater recovery through research.

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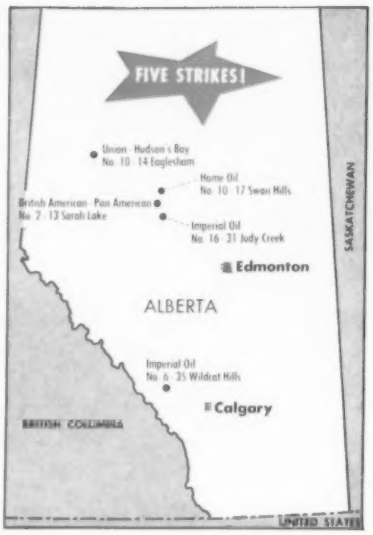

Alberta—A string of five oil and gas discoveries reported in various areas of Alberta this week underscore the exploratory potential of the province.

Union Oil Co. of California and Hudson's Bay Oil & Gas Co. No. 10-14 Eaglesham, lsd 10-14-77-25w5, was completed for "more than 1,000 b/d" of 38-gravity oil from the Normandville (Devonian) reef at 7,605 ft. The discovery is 18 mi. southwest of Normandville field.

In the booming Swan Hills area, Home Oil Co. et al No. 10-17 Swan Hills, lsd 10-17-68-10w5, was completed for 984 b/d of oil, based on 5-hour test through 20/64-in. choke and perforations in the Swan Hills member of the Beaverhill Lake, topped at 8,100 ft. The discovery is 3 mi. northwest of production in Swan Hills field, giving the field a present indicated length of 13 mi. north-south, and a maximum width of 7 mi.

Some 18 mi. southwest, in the Virginia Hills area, British American Oil Co., Ltd., and Pan American Petroleum Corp. No. 2-13 Sarah Lake, lsd 2-13-65-11w5, flowed at the rate of 695 b/d on 2¾-hour drillstem test of the Swan Hills-Beaverhill Lake. The discovery is 8 mi. southwest of a recent discovery by the same group.

Also in the Virginia Hills area, Imperial Oil Ltd. No. 16-31 Judy Creek, lsd 16-31-63-10w5, flowed an undisclosed amount of 41-gravity crude on 30-minute test of the Beaverhill Lake at 8,310-95 ft.

In the Wildcat Hills region, 45 mi. northwest of Calgary, Imperial Oil Ltd. No. 6-35 Wildcat Hills, lsd 6-35-27-6w5, flowed 20-million cf/d of gas from the Mississippian, topped at 10,821 ft. The discovery is 30 mi. north of Jumping Pound gas field.

World's Longest Single-stage Cement Column—18,819 Feet

...Made Possible by Diacel* Cement Systems...

1-EE University in Pecos County, Texas, the world's deepest well (25,340 feet) recently established new records for casing and cementing. At the 22,919-foot level, a 7- and 7⅝-inch casing string was run to seal off nearly 12,000 feet of open hole extending below a 9⅝-inch string set to 10,996 feet. In cementing, the slurry reached from the casing shoe at 22,919 feet up to 4,100 feet—the longest single stage cement column ever placed . . . some 18,819 feet.

For this difficult job, the slurry weight was kept at 10.8 lbs./gallon with a low-density system of 40% Diacel D and 1.5% Diacel LWL (a low water loss and retarder additive) mixed with slow-set cement. Displacement pressure averaged about 1600 psi during most of the job. Logged bottom-hole temperature was 315°F. In all, mixing, pumping and displacing some 5,183 cubic feet of this low-density cement slurry required only 3 hours and 37 minutes . . . well within the calculated pumping life of 5 hours and 4 minutes.

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1-EE University, drilled to a record depth of 25,340 feet. Insert shows bottom joint of 7-inch casing going in.

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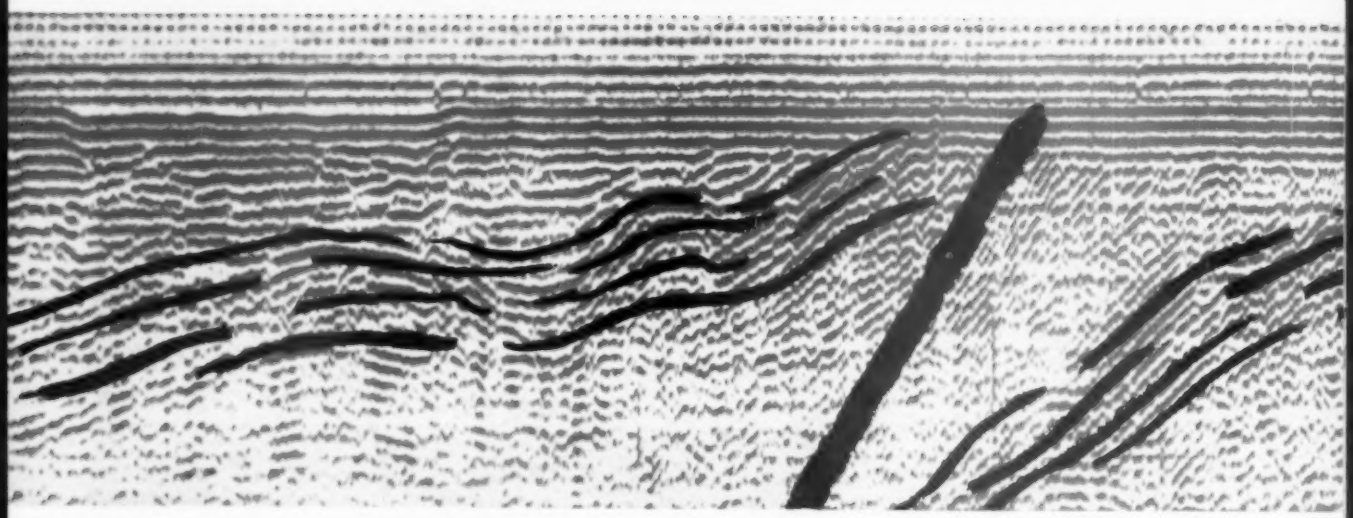


In Exploration, the Problems Are

SPECIAL REPORT
EXPLORATION

While the need for new petroleum reserves grows more crucial, the difficulties in finding them become greater, and the incentive (profit) lessens. As one official of a Texas exploration company puts it: "All we have to do is find the amount of new oil the boss wants at about one-tenth the cost."

The oil industry apparently has reached the conclusion that, unless some completely new techniques are developed, present methods will have to be used in combination if the remaining reservoirs are to be pinpointed. This means the "general practitioner," rather than the specialist, will be in demand.

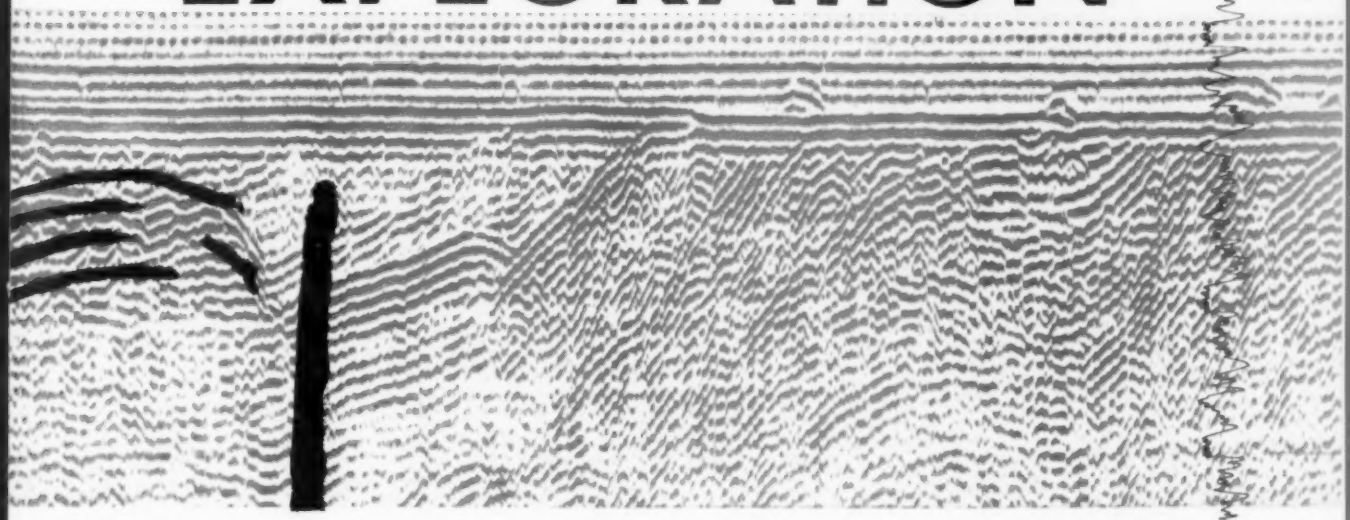
Insofar as equipment is concerned, some of it is so advanced that "old timers" are having a tough time even understanding how it works.

On the exploratory front, geophysical activity is at a low ebb, but should be a little better than it was in 1958.

Some other fairly clear trends are evident:

- Geophysical equipment is getting smaller, more portable.
- There is a stronger effort to correlate all available knowledge.
- Extra-deep exploratory drilling probably will be a rarity, unless the economic climate improves.
- The number of exploratory companies active in foreign countries will continue to increase.

EXPLORATION



Tougher, Incentives Are Weaker

The law of diminishing returns seems to be the current rule in exploration. While tools are better, and methods improved, the search for new petroleum reserves is resulting in fewer significant discoveries, at considerably greater cost and effort.

Fading fast—if not gone already—are the days when large oil fields could be located through the structural method, which was rewarding enough when the oil industry was still young, and the big fields were yet to be found.

This passing of an era, however, does not alter the basic problems facing the exploration industry: How can the remaining reserves be discovered—economically?

The cost of finding petroleum accumulations continues to be the major headache of the exploration industry.

PETROLEUM WEEK has found that, almost to a man, those charged with finding new reserves are more concerned and worried about this problem than any other.

The exploration manager for one major company says that recent developments in exploratory techniques have, for the most part, increased costs instead of lowering them. He adds: "Something is needed to reverse this trend—some entirely new concept."

His counterpart at another major company says this is "the most vital problem facing oil exploration personnel at present. All of us have long recognized the need for a cheaper drilling tool that can test sand lenses or stratigraphic traps from which a large portion of our future oil supplies must come."

The second major problem confronting the exploration industry: How to locate the elusive stratigraphic trap?

"Exploring for stratigraphic traps is a punchboard proposition," says one geologist. "The only known method of finding them is to outline the sand bodies by test drilling."

An exploration manager says: "As oil becomes harder to find, it will just take more drilling. This is especially true when you're dealing with stratigraphic entrapments." And the executive vice-president of a large exploration company calls the strat trap problems a "major frontier" for research.

Not only is this kind of trap the hardest to pinpoint, but the exploration man also feels more acutely the need for solving it, because "the only big finds left will be in strap traps."

"What we need is some specific method that some fool—who doesn't know it won't work—will develop," says a Dallas geophysicist.

SENSING DEVICE of new nuclear magnetometer for aerial surveys is held by a Spartan Air Services physicist.

continued ▶

NEW 'THUMPER,' for use in weight-dropping seismic exploration, is equipped by McCollum Exploration Co.

The Need: A Major Breakthrough

Typically, the petroleum industry is taking a dynamic approach to the exploration problem. Skilled scientists are now working in laboratories throughout the country on some of the exploration industry's most frustrating problems. The hope is that a major breakthrough—of some kind—will emerge from their efforts.

Most exploration men, both in the field and research, are inclined to agree with this viewpoint of F. J. Agnich, president of Geophysical Service Inc.:

"Increasing efficiency, thereby effecting economy, is one of the approaches to finding oil at a smaller cost per barrel.

"But the big way is to find the oil that we haven't been able to detect so far. And small improvements in equipment and methods won't get the job done.

"We've got to have improvements on the order of two to ten times better than what we have now. We have to have some breakthroughs—really big improvements."

The possibilities for developments of this magnitude range from a better basic knowledge of petroleum itself to new technical devices.

Some long-range answers are virtually certain to result from the basic research now going on.

Laboratories all across the country are involved in such fundamental studies as the origin and behavior of petroleum hydrocarbons.

By understanding these elemental facts, oil men hope to find the clues that will lead them toward the previously undetectable accumulations.

One of these fascinating research trails—and the rewarding treasure at its end—has been described by C. I. Alexander, of Magnolia's Field Research Laboratory. Alexander notes that a buried sandbar 4 mi. long, ½ mi. wide, and 20 ft. thick "could contain roughly 50-million bbl. of oil."

The drawback, of course: Exploration personnel lack the clues they need to find these buried bars, sandy beaches, and deltas of ancient seas.

Some clues to now-hidden reserves may develop from studies of modern sediments and the way they are formed.

For instance, by learning enough about the "sand habits" of sediments being laid down today, the oil hunter may eventually be able to delineate present subsurface features. He may be able to determine whether they are from old sea bars or river bars;

continued ▸

Fiberglass case (on all units) has integrally-molded steel brackets which provide a means of attaching straps for portable use.

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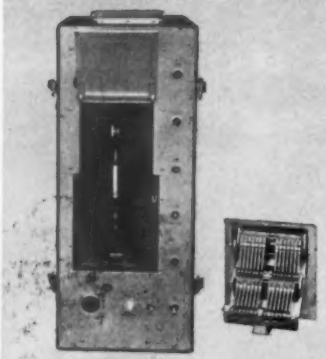
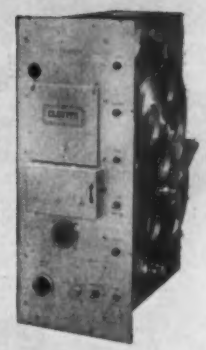
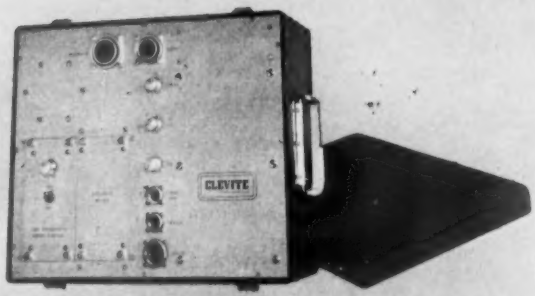


MFR-1 MAGNETIC FIELD RECORDER
28-channel, individually sprung FM or AM heads. Complete head bank is mounted on precision ways and removable without tools. Single channel may be replaced and phased in the field.

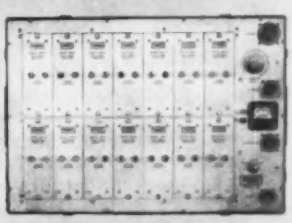


Unique belt drive system of stainless steel is servo-controlled and locked to precision fork frequency standard.

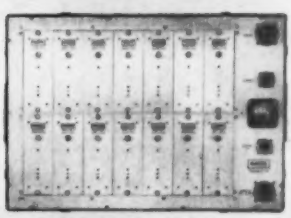


TFP-1 MOTOR DRIVE SYSTEM AND POWER UNIT (Transistorized)
Power unit contains 400 cps time standard, phase comparator, motor drive oscillator, motor drive amplifier, and auxiliary power supply.

MFM-1 MAGNETIC FIELD MONITOR
Four-inch electric writing paper with preprinted timing lines. Rectilinear electric or ink stylus.

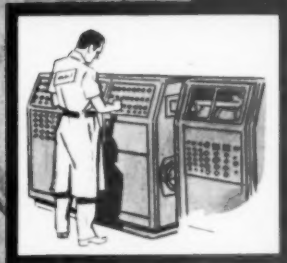


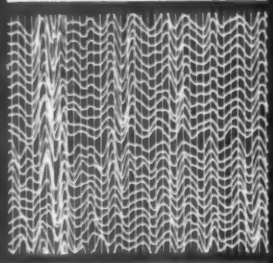
MM-4 MAGNETIC MODULATORS
14 dual channels plus control and metering panel.



DM-2 FREQUENCY DEMODULATORS
14 channels per bank.

Where accuracy begins





Visit the research-development laboratories of General Geophysical Company in Houston, Texas. You'll find a hum of intelligent activity. The problem of the day may be the improvement of radio equipment for offset shooting. Or, perhaps it pertains to the development of a new seismic amplifier using transistors. Whatever the problem, you'll see progress in the making. These extra efforts to provide the most accurate field data for its clients have made General Geophysical Company synonymous with progress in geophysical instrument development and technique research. The extensive information and improved equipment resulting from this program are used on your prospect each time you place one of General's *experienced* crews in the field.

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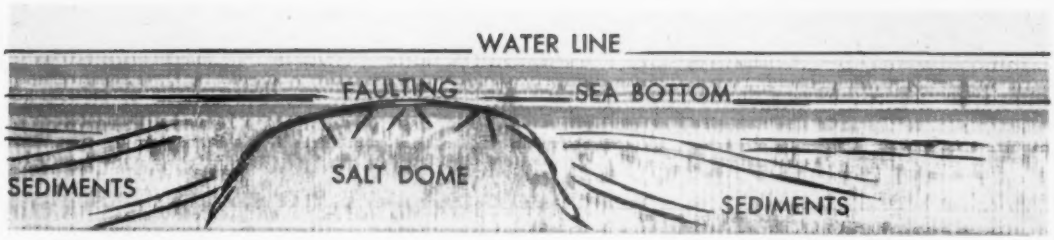

CONTINUOUS SEISMIC PROFILE, as recorded by a "Sparker," which uses 12,000-volt electric spark for reflections.

whether they were right on the shore of the sea, or some distance from the shoreline, and how far out.

The Magnolia lab just recently developed a new kind of electronic circuit to help measure the age of deposits more accurately. For some time, Magnolia has used methane as the "counter" gas in determining age by the Carbon 14 method, which permitted working with smaller amounts of carbon and simplified purification of the materials under investigation.

The accuracy of radiation counting devices, however, could be impaired by the entrance of radiation from outside sources. The new type of circuit detects the entrance into the counting cell of any stray, outside radiation and automatically discards the count caused by outside sources.

As basic research begins to supply some of the answers, it is entirely possible that operating exploration personnel may be confronted with a brand new concept of oil finding, requiring a considerable adjustment in methods and procedures.

The laboratory chief of one Texas-based major puts it this way:

"Trying to find a method for locating stratigraphic traps has meant a reorientation of our entire research program.

"It has first been necessary to develop new methods for researching it. They have been working out, and it is a matter of trying to find the specific solutions.

"Those solutions may be either geological or geophysical. But I believe they will be so different from what we have found in the past that the operational people in the oil companies will have to do things altogether differently from what they have ever done before in locating petroleum accumulations."

Exploration personnel, for example, may be working with entirely different kinds of maps.

This doesn't mean that all of the exploration maps in use today will simply be tossed away. Even some strat traps can be found with the methods—or variations of them—in use today. But for those traps that aren't detectable, a new idea of interpretation and mapping will be necessary.

For example, suppose much more is learned about "sand habits," so that it becomes feasible to locate many of the difficult-to-find traps by such things as the nature of the sand grains, the way they lie in the subsurface beds, and so on.

At the same time, suppose it has become clear that certain types of tiny animal fossils are common to the bars and shoals of seas, but not to old river beds, and that they are always found in a certain relationship to the ancient seas. It would then become possible to map the course of ancient sandy shores.

The exploration man's map might, in such event, sport a good many symbols that do not appear upon it at present.

There already is in existence a device which, its developers believe, is capable of correctly orienting, at the surface, a core in the direction in which it lay below ground.

The course, then, of an underground reef or bar could be deduced from well information brought to the surface—even to the extent of predicting curves and twists in the reef.

A "radically new" method of surface exploration for oil, utilizing the principle of resistivity of oil-bearing formations, is under consideration.

This particular approach is being studied at the Southwest Research Institute, San Antonio, Tex. It is based on the idea that oil-bearing formations are as much as ten times as resistive as non-oil-bearing strata. The device would use a continuous direct current. It is believed, further, that the technique will be capable of detecting resistive formations at depths of over a mile.

"While this is not a direct oil-finder, it would be more direct than the seismic method," says SWRI's John C. Cook. He adds, however, that the method would require "favorable geological circumstances," and that results would depend on the type of subsurface fracturing, subsurface water conditions, and the like.

SWRI, a nonprofit organization, hopes to bring the device far enough along within a year to be able to offer it to some sponsor for further development.

Another possibility under study is the taking of gravity readings on a continuous-motion basis.

Up to now, in gravity logging, it has been necessary to bring the instrument to a stop for each gravity reading taken downhole.

SWRI believes that the use of several modified gravity meter elements, simultaneously, might permit the taking of readings while the instrument is in motion.

One application of this principle would be the development of continuous gravity logging in bore holes at a reasonable rate of speed.

SWRI has proposed to some service companies

continued ▶

that this type of program be investigated. While the technique is still in the proposal stage, it is believed that a logging speed of perhaps 100 ft. per minute could be obtained.

The potential uses of this "fully gravitational" method of logging are manifold:

(1) It would provide another means of specifically identifying formations, giving exploration and production personnel an independent identification tool.

(2) It would permit the accurate correction of surface gravity surveys.

(3) It would permit the refining of seismic data, when used in conjunction with velocity logging, and give a true density log.

The new method, it is thought, could determine the true density of layers to within 0.1 gram per cc., resolving strata of 6-ft. thickness and more.

Tools, Techniques Improve

Here and there, advanced new tools and techniques are showing up in the field. One of the significant new developments is the growing correlation between velocity (acoustic) logs and seismic results.

Exploration personnel are just now beginning to appreciate the potentialities of this method.

Velocity logging, itself, has just now begun to catch on in a big way for exploratory and development drilling purposes (PW—Feb.27'59,p16).

As a matter of fact—although the velocity log is proving itself a valuable production tool—the device originally was conceived as a geophysical tool.

The idea was to give the geophysicist a highly accurate means of determining sound velocity through various specific formations encountered in a given area.

Because the velocity log provides true values for a particular sediment, it is proving to be an extraordinary aid in correcting seismic errors.

Certain sediments (such as the Ellenburger in West Texas) can be identified readily on a field seismogram. But the velocity log provides the true velocity reading for that formation, whereas the seismogram does not. Comparison of seismic shooting records with velocity logs helps the geophysicist to pick out previously passed-over structures.

Also, the technique helps to reduce the amount of "false structure" occurrences in seismic shooting. In some areas where there is a marked difference in the vertical velocities between various types of sediments, and the nature of the sediments isn't known, it is possible to get a "false structure" picture.

For instance, a shelf-type sand and shale might have a velocity of 8,000 to 12,000 ft. per sec., compared to a velocity of 18,000 to 24,000 ft. per sec. for massive lime and dolomite. Shooting across such an area might indicate the presence of a structure that doesn't exist, simply because of these varying velocities.

But velocity logging of holes drilled through these sediments permits accurate correction of the seismic information.

The velocity log has made possible an entirely new technique—the preparation and use of "synthetic seismograms."

ALL-TRANSISTORIZED portable seismic amplifier system, developed by Texas Instruments, Inc., is lifted easily.

From the velocity log, an "ideal" seismogram, free of extraneous reflections, bouncing, noise, and the like can be computed, resulting in a so-called "synthetic seismogram," which shows what a true seismogram should look like in that particular vicinity.

By placing the true seismogram alongside the "synthetic," the geophysicist can pick out the "primary" or accurate reflections on the true seismogram and discard the "multiples" or distortions.

This also provides a more certain identification of the reflecting horizons.

This technique may open the door a crack toward a solution of the stratigraphic trap problem.

By comparing true velocities with his seismic information, the geophysicist can prepare a far more accurate subsurface contour map, because he can identify specific reflection points as to depth.

The geophysicist can also prepare more accurate "average interval" velocity maps as the number of velocity logs grows. This advantage may lead to location of some previously unsuspected strat traps.

When correlated with actual seismic records and with "synthesized seismograms," velocity logs of producers drilled into strat traps and of dry holes in the same vicinity could be put together empirically by the geophysicist to define the producing limits of the productive trap.

New: Horizontal Compositing

Another development that the industry will be hearing a great deal about is "horizontal compositing"—a technique designed to overcome the interference of surface waves in seismic exploration.

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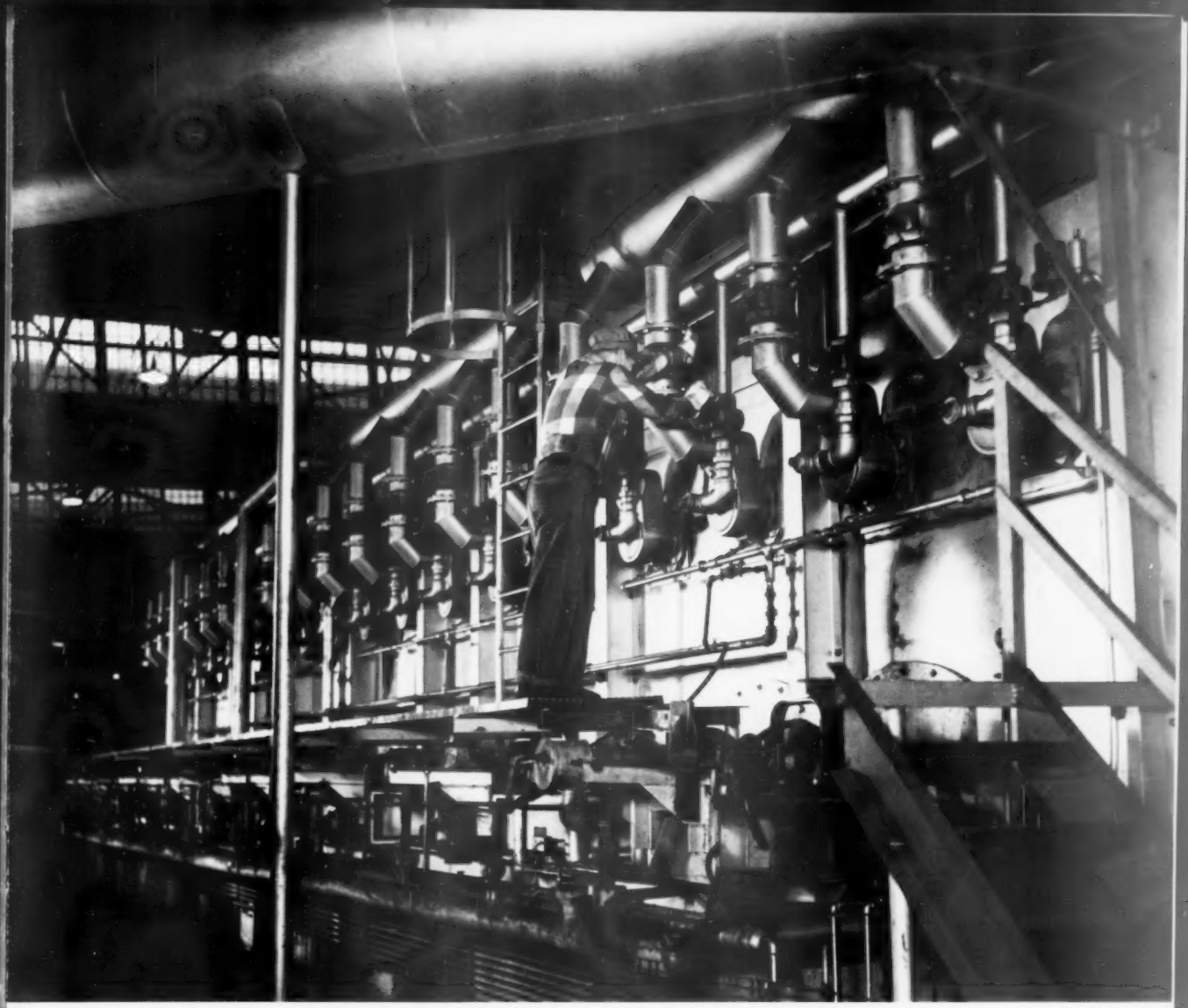

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SPANG Drill Pipe and Tool Joints

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				Grade D	Grade E	Grade G†	Grade D	Grade E	Grade G†	Grade D	Grade E	Grade G†
Inches	Pounds	Inches		PSI			1000 Lbs.			PSI		
2⅞	10.40	.362	2.151	10730	13210	18980	157	214	300	12120	16530	23140
3½	★ 9.50	.254	2.992	—	8080	11610	—	194	272	—	9530	13340
	13.30	.368	2.764	9170	11290	16230	199	272	380	10120	13800	19320
	15.50	.449	2.602	10900	13420	19290	237	323	452	12350	16840	23570
4	★11.85	.262	3.476	—	7080	10170	—	231	323	—	8590	12040
	14.00	.330	3.340	7380	9080	13060	209	285	400	7940	10830	15160
4½	★13.75	.271	3.958	—	6280	9030	—	270	378	—	7900	11070
	16.60	.337	3.826	6760	8310	11950	242	331	463	7210	9830	13760
	20.00	.430	3.640	8420	10370	14910	302	412	577	9200	12540	17560
5	★15.00	.296	4.408	—	6130	8810	—	328	459	—	7700	10880
	19.50	.362	4.276	6550	8060	11590	290	396	554	6960	9500	13300
5½	21.90	.361	4.778	5770	7100	10200	321	437	612	6320	8620	12060
	24.70	.415	4.670	6800	8370	12040	365	497	696	7260	9900	13860

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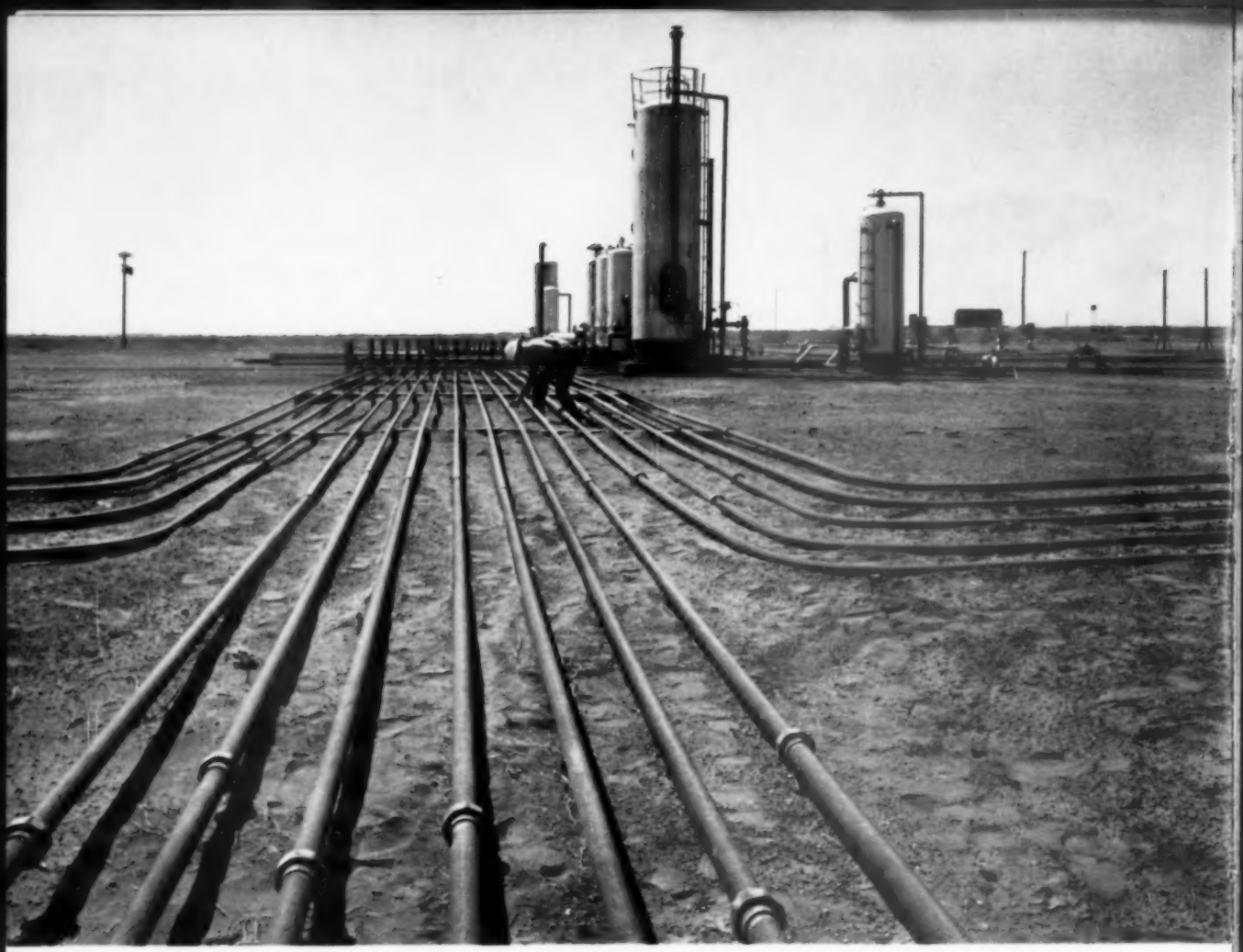

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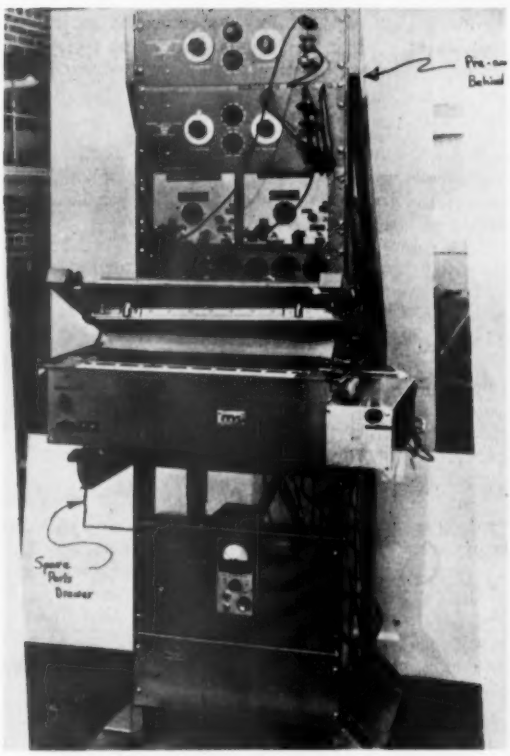
'SPARKER' TRANSMITTER is the electric-signal source unit for this continuous seismic profiling device.



'SPARKER' RECEIVER picks up the continuous reflections from between 400-1,200 ft. beneath the surface.

In certain areas, some sound waves from the dynamite blast travel to the geophones, along the surface and just below the surface, in such a way that they obscure signals reflecting from the target bed.

By setting off a series of shots—moving each shot hole a specified distance horizontally from the preceding one—and, at the same time, moving the geophones horizontally, so that the distance between geophones and shot is progressively widened—it has been found possible to overcome the surface-wave difficulty.

This method, in effect, changes the surface waves resulting from each shot, while the signal reflecting from the bed below remains constant.

Southwestern Industrial Electronics Co., which calls this particular technique "the multiple-ray-path-to-a-common-reflection-point technique," has developed specific instrumentation—the MS-18 GeoData System—to assist in this method.

The technique requires the use of magnetic tape and, again, is an advance in the art of correlation, which many believe is the most promising approach to the finding of more oil.

Miniaturization Increasing

Miniaturization is more than a catchword in exploration instrumentation today.

Some of the most intensive research at SIE is concerned with reducing the size, bulk, and weight of equipment.

Texas Instruments Inc. recently put its "Explorer" seismograph on the market—an all-transistorized, 24-trace system weighing only 57 lb.

Clevite Corp. also is now building a portable FM-AM transistorized recording system, incorporating a recorder (with a stainless-steel belt drive), a motor drive and power system, and a field monitor.

Besides the portability feature, such equipment possesses other inherent advantages. For one thing, power requirements often are reduced, as well. For another, there is—in some cases, at least—a substantial differential in price. One manufacturer, for example, quotes a price of $12,500 for a miniaturized system designed to do the same job as standard equipment costing about $34,000.

But there isn't a head-long rush into the perfecting of pocket-size instruments just for the sake of reducing size.

Transistor-minded experts say performance is comparable with vacuum-tube type equipment, with the added advantage of portability, less weight, lower power requirements, and so on.

On the other hand, some exploration personnel

continued ▶

maintain that transistorized equipment is more susceptible to climatic conditions, and doesn't give the same performance. There are those who even doubt the value of reducing the size of instrumentation equipment.

In fact, some exploration engineers wonder if the instruments and devices now available actually are being used to their full advantage. They believe too little emphasis is put on interpretation.

"The oil companies aren't using the instruments that they now have," says one manufacturing source. "The instruments are advanced far beyond the ability of exploration departments to use them fully."

On a related tack, there is this comment: "For some reason, the oil companies seem hell-bent to pile up as many records as they can and just store them some place. They'll shoot 10,000 mi. and consider that area 'explored,' when they simply won't cut loose the kind of money they should for interpretation. I just don't understand it."

But, thanks largely to development of magnetic tape, the interchange of seismic records between companies is growing, especially in foreign areas, where the interchange helps to cut exploration costs. Even though each of the interchanging companies receives the same records, they often come up with differing results, according to the manner in which they analyze the tape in playbacks. The result is a considerable widening of the exploration horizon in a given area.

The "Sparker" Looks Good

The "Sparker"—a continuous seismic profiling device—is another highly interesting instrument now in field use.

This approach, in many respects, is quite similar to the Sonoprobe technique, but there are differences. For instance, where the Sonoprobe uses a higher frequency magneto-strictive sound source, the Sparker utilizes a lower-frequency sound generated by a spark discharge. And there are other dissimilarities, such as the recording presentation.

The Sparker was developed at the Woods Hole Oceanographic Institute, Woods Hole, Mass., by J. B. Hersey and S. T. Knott. It has been licensed exclusively to Marine Geophysical Services Co., Houston, which is headed by Charles B. Officer.

Officer, formerly on the Woods Hole staff, also is a lecturer in geology at Rice Institute.

While the device has been used by both Woods Hole and the Lamont Geological Observatory primarily for academic purposes, the Sparker's two chief commercial uses are:

(1) Exploration for geological structures related to petroleum accumulations.

(2) Marine engineering surveys for soil foundation studies, as an adjunct to boring for the determination of sheer strength, and so on. This application is concerned largely with offshore drilling operations.

The Sparker produces a record which, essentially, is a geologic profile of subsurface structures in the area surveyed.

This record actually is a graphic plot, horizontally and vertically, of a geologic section. One coordinate is horizontal distance (depending on the constancy of the surveying vehicle's speed) and the other is a vertical coordinate of the reflection time for the signal (essentially, a vertical depth scale).

DATA PROCESSING CENTER set up recently in London by Geophysical Service Inc., handles magnetic tapes, discs.

In principle, the device is similar to the operation of a fathometer or echo-sounder used at sea to obtain a profile of the bottom. The big difference is in the sound source.

Instead of a sonar-type signal, the Sparker emits a 12,000-volt electric spark, or "explosion," about on the same order of intensity as the setting off of a small blasting cap.

Depending upon the particular area, the device is able to obtain continuous reflections from 400 to 1,200 ft. beneath the surface of the soil by use of this spark "explosion" source.

Each of these repetitive "bangs" is triggered to correspond to the zero mark on the paper record. There is, therefore, a true measurement of the time the signal requires to strike a reflective surface and return to the device's receiver.

Since this is repeated at intervals of ¼ to ½ second as the survey is made, the record takes the form of a continuous graphic picture—not only of the profile of the sea bottom, but also of the profile of the geologic horizons beneath the bottom.

Among its obvious advantages, the Sparker lessens the amount of interpretive work necessary. "What it sees, you see."

The device maps the structures it "sees" exactly as they are—and in detail. So it isn't necessary to "interpret" the results, in the usual sense. The record itself is a "picture" of the subsurface geologic section.

Because it can be used to make surveys rapidly and cheaply (the company estimates the cost at about

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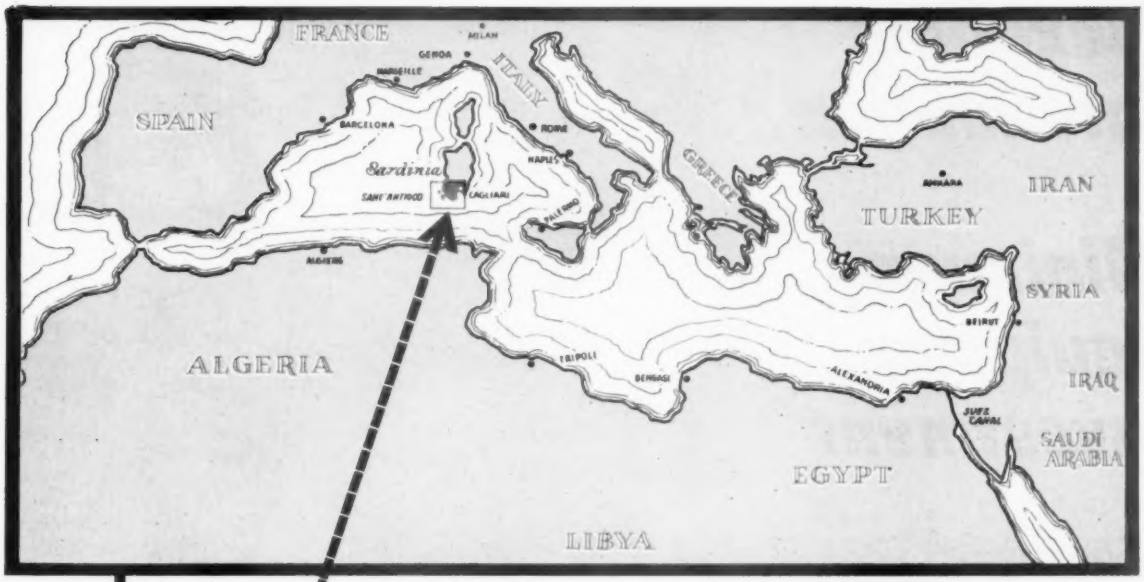

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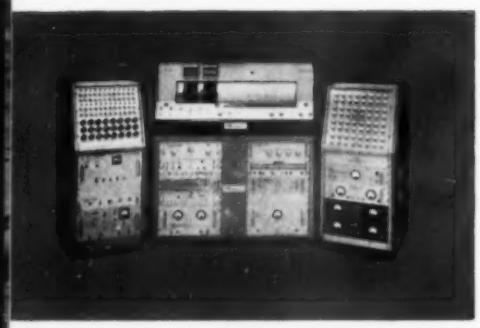

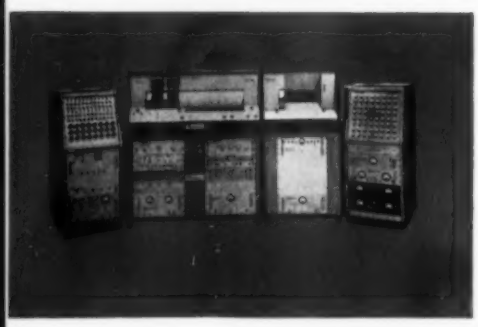

SIE **MS-12** GeoData System will process up to 15 magnetic recordings hourly, presenting a finished seismic time section at low equipment and operating cost. FM or direct (AM) tapes can be analyzed and the resulting pen-sections can be reproduced by Ozalid type processes. Trial filtering and mixing schemes can be observed on the oscillographic drum before sections are made. Weathering, elevation, normal moveout, and spread configuration information correction factors are generated electronically for ease of change or setting in data. A true horizontal scale can be presented even though spread lengths vary.

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one-fifth to one-tenth the normal cost of gravity or seismic surveying), the Sparker is quite useful as a reconnaissance tool.

The instrument is reasonably portable and compact, with a total weight of only 900 lb. (1,200 lb. crated for air shipment), making it practicable "to go into an area and out of it with a minimum of trouble."

Only a two-man crew is required for operation.

There are some disadvantages, however—the chief one being that the depth of penetration is limited. And, up to now, the Sparker has been used only for over-water surveying. Work is under way to lessen both drawbacks.

The effective depth range of the Sparker will vary from area to area, but the 1,200-ft. figure is just about the maximum subsurface penetration so far. Even with this limitation, salt domes, faults, and other anomalies that show up at shallow depths are easily detectable.

The "bang," or spark signal, is generated by a large transformer and large rectifier tube which charge up condensers. The condensers are discharged periodically through a spark gap.

The company says it should be possible to improve the penetration efficiency of the signal by increasing the charge, and that "development is now under way" to do this.

Because of its reasonable compactness and lightness, the device probably could be truck-mounted.

The Sparker isn't directly competitive with seismic instruments.

While the device might show a fault or a structure very clearly in the upper strata, it doesn't indicate what the unconformities may be like at greater depths. In some instances, though, the information it provides for the upper formations is workable for interpretation of conditions at greater depths.

Seismic shooting, however, is usually necessary for information on deeper conditions.

The two actually are more complementary than competitive and, as Officer observes, "work fairly well together."

Weight Dropping on Increase

Aside from its specific nature and application, the Sparker is illustrative of a key development in exploration—the search for better signal sources. In this connection, use of the earth "Thumper," or weight-dropping, technique apparently is on the increase.

The use of dynamite as the signal source carries with it certain disadvantages. The precise reproduction of a charge is virtually impossible. Another drawback lies in the high-frequency signal given off by dynamite —a signal that isn't the best answer in some areas and under certain conditions.

The dropping of a weight, on the other hand, provides a low-frequency signal that can be reproduced, almost identically, if necessary.

In areas where the high-frequency signal of dynamite is absorbed readily at the surface, the weight drop's low frequency signal is more elastic, and most of it is projected straight down. So, in such instances, the penetration of the energy generated by the weight drop is better.

Because of this, and possibly also because of improvements in equipment, the technique seems to be attracting more attention than before.

McCollum Exploration Co., of Houston, has five weight-dropping crews working steadily in West Texas now, is planning on adding two, or perhaps three, more crews before the year is out. The company also is updating its older units, and building new ones.

A merger was effected recently between McCollum and the Robert H. Ray interests, to form McCollum Ray International, Inc. Under the new setup, the company expects to have three to five weight-dropping crews operating in the Eastern Hemisphere (primarily in desert areas) within the next two years.

Oil companies, too, are continuing experimental work in this field. Continental Oil Co., for example, still is operating its "Vibroseis"—a combination of mechanical earth vibrator and giant electronic computer.

At least one other major company is known to be conducting similar work, and a third is also believed active in it. There may be others.

Weight-dropping techniques have evolved to a point where procedures are varied to meet particular conditions. And equipment has been improved, as well.

The methods used by McCollum give a good illustration of this point. In "really good seismic areas," such as the Gulf Coast, a weight-dropping survey

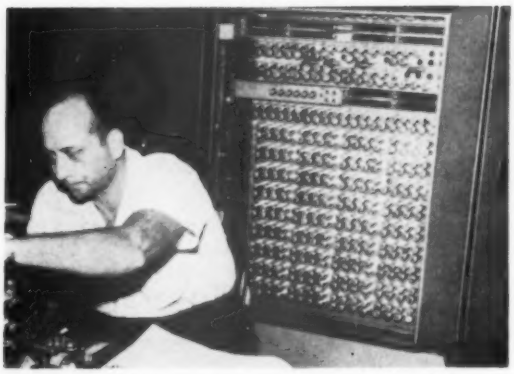
continued ▶

Geophysical Crew Months—1958

	Seismic Co.	Seismic Cont.	Gravity Co.	Gravity Cont.	Magnetic Co.	Magnetic Cont.	Total
Texas	759	903	97	99	12	8	1,878
Louisiana	425	550	77	36	—	—	1,088
New Mexico	202	231	40	25	12	—	510
California	45	49	12	6	—	—	112
Wyoming	153	144	—	4	—	—	301
Colorado	92	53	9	29	—	1	184
Montana	59	82	5	—	—	1	147
Florida	44	4	—	15	—	—	63
Utah	102	85	—	25	—	—	212
Oklahoma	150	131	—	—	3	—	284
North Dakota	58	58	—	5	—	—	121
Mississippi	146	252	28	24	—	—	450
Kansas	35	68	12	—	6	—	121
Alaska	—	40	2	—	—	8	50
Others	64	80	22	40	3	1	210
Total	2,334	2,730	304	308	36	19	5,731
	5,064		612		55		
1957	6,283		879		80		7,242
1956	6,813		998		45		7,857
1955	7,090		1,074		76		8,240

GEOPHYSICAL-CREW-MONTH ACTIVITY dropped again in 1958, reflecting the general downtrend in drilling activity last year. Best estimates are that activity will rise slightly this year, but will still be far behind 1957.

SOIL TESTS are conducted by a Southwest Research Institute team as part of a long-range research program.



DIGITAL COMPUTER is used by Atlantic Refining Co. to improve signal-to-noise ratio in seismic instruments.

usually will be run in a straight line. In "fairly good areas," the pattern most likely will be a "sawtooth" or "zigzag" one.

But in "difficult areas," such as West Texas, McCollum utilizes the circle pattern. In some instances, the circle made by the weight-dropping truck will be 200 ft. in diameter, in others 500 ft. But in any case, the circles overlap each other by the length of the radius.

In making a 200-ft. circle, the truck will make 48 drops; in a 500-ft. circle, from 72 to 96 drops.

McCollum now is using as many as 288 geophones per patch, covering an 800x500-ft. area. Using a four-drum field recorder, the company can record results from four geophone patches at a time. With this technique, a weight-dropping crew is able to cover 2,000 ft. of subsurface with 1,000 ft. of surface work.

Because of equipment improvement, the flexibility of choice in patterns, and the inherent nature of the method, McCollum says the weight-dropping technique is proving successful even in such areas as the Delaware Basin, with virtually no limitation on depth.

Other Approaches Explored

Experimentation with a radio wave signal continues, although it hasn't yet proved practical in the field.

The theory behind this method has been recognized for some time. Basically, the technique is the familiar seismic one. Radio waves are sent downward, and the time they require to reflect back from subsurface structures is recorded.

As with other efforts to find a new and better signal source, the blast effects of dynamite would be eliminated.

At least one major oil company is experimenting actively with the device. The main objective is the improvement of the signal source to produce better reflection results.

Engineers and designers—fully aware of the cost problem—also are trying to come up with something that will help trim exploratory drilling expenses.

One of the more interesting developments along this line is an effort to perfect a drastically new type of rig for stratigraphic tests.

Details are confidential, presently, but the rig would incorporate such features as: (1) drill pipe that would, in effect, carry its "casing" with it; (2) provision for continuous coring during drilling; and (3) a power swivel.

Design plans call for an extremely high degree of mobility. If the design pans out, it would fill the needs of exploration personnel who maintain that the best way to find stratigraphic traps is by a fast-moving, inexpensive strat test drilling program.

While many current and projected developments are based on attempts to find something brand new, the oil industry also is falling back on some earlier methods or, at least, re-evaluating them. The interest in geochemistry is an example.

There seems to be a growing feeling that the geochemical approach—which many oil men had written off—is worth serious investigation and field evaluation (PW—Jan.23'59,p25).

Some exploration people, at least, feel that it will be in this area, or some similar approach, that the next big breakthrough in exploration will occur.

In geophysics, as in geology and chemistry, some of the earlier methods are undergoing something of a rebirth as a result of additional knowledge and improved instrumentation. The refraction method of prospecting, for instance, again is being utilized.

In some areas there is a relatively shallow layer of very dense material. In reflection-type seismic shooting, reflections from deeper structures may be obscured by reflections from this upper layer.

To get past this layer with the reflection method, it usually is necessary to undertake an expensive, detailed, pattern-shooting program, with multiple seismometers.

By using refraction, instead of reflection, this shallow layer can be, in effect, "bypassed" so as to record reliable information from greater depths.

GSI, for one, is using the refraction method "in a number of foreign and domestic areas."

continued ▶

There Are Still Good Hunting Areas

There are several domestic provinces that are promising enough to attract a substantial amount of attention in the coming months. One of the most significant of these is the Anadarko Basin.

Lying in northwestern Oklahoma, western Kansas, and the Texas Panhandle, this area—particularly the northwestern Oklahoma part of it—shows up clearly as a prime, immediate exploration target.

"It's hard to get off a good horse, as long as it's running strong," says the chief geologist for one Mid-Continent major. And, as many oil men point out, the basin's multipay possibilities—for both oil and gas—is a strong factor.

Better marketing possibilities, typified by the new Jayhawk pipe line, make it attractive also (PW—Jan.23'59,p41).

Not the least of the favorable factors is the relatively shallow drilling involved. Over most of the area, depths to the potential pay zones are less than 7,000 ft. (although, of course, in some portions of the basin drilling depths will run greater than 10,000 ft.).

But exploration interest spreads much wider, ranging from Alaska to the Gulf of Mexico. Among the most promising areas:

Alaska—For the moment, activity will focus on the coastal areas. But major structures existing throughout the state insure that it will remain an active frontier for petroleum exploration for many years. Some of those going into the play consider it one of the world's best remaining oil-hunting grounds.

This summer seems sure to see the most active exploratory effort to date in the new state. Standard Oil Co. of California will have two rigs running; Humble Oil & Refining Co., Halbouty Alaska Oil Co., Alaska Consolidated Oil Co., and Colorado Oil & Gas Co. each have one; and General Petroleum Co. expects to spud a wildcat before long.

South Louisiana—Any slackening of pace here will be slight, indeed, and prospects are for an upturn. Despite years of exploratory activity, this area—including the adjacent offshore—is considered one of the best domestic bets, and continues to attract a large part of the Gulf Coast exploratory budget.

Texas—In the Panhandle, the exploratory activity merges into the Anadarko Basin play. South and Southwest Texas are off considerably, but shouldn't slip further.

The Mexia-Talco fault system, in its northeast Texas portion, evidently is on the verge of stepped-up exploratory drilling, sparked by two recent Titus County discoveries (PW—Feb.20'59,p36). One of the successful wildcats is producing from the Woodbine formation and the other from the Glen Rose—both new producing horizons in the vicinity.

And in West Texas, the outlook is for good activity. This year, shallow drilling in the Delaware Basin will be a major target, with new wildcats being scheduled almost daily. There also is a good possibility for more deep drilling in the Sheffield Channel area of Pecos County, where the world's deepest hole was plugged by Phillips Petroleum Co. (PW—Feb.13'59,p21).

The Rockies—This region is cited by some as scheduled for a good chunk of exploratory work this year. Some specific areas to watch: The Powder, Green River, and Washakie Basins of Wyoming; the Paradox Basin; and south-central Utah. The Dakota play in the San Juan Basin will be interesting, and the Black Mesa Basin of Arizona has potentialities. The northeastern section of the Williston Basin and the Teton County area of Montana are other areas to watch.

West Coast—The big play will come in three major sectors: offshore, the San Joaquin Valley, and the Los Angeles area. Offshore exploration is under way on six leases, with additional activity apparently waiting on the outcome (PW—Feb.20'59,p54).

It also appears that some areas that have been comparatively dormant will be fairly active this year.

Mississippi, with its Tuscaloosa play, and Arkansas are both coming back into the picture more strongly than in a long time.

In Kansas, the push is oriented westward (again, with the Anadarko Basin as the magnet), although a bigger play also is expected in the Forest City Basin in the northeast, and the Salina Basin in the north-central area.

Although northwest Oklahoma is considered most likely to set the state's exploratory pace, other areas in the state will come in for a substantial amount of exploratory drilling, particularly the McAlester Basin, of eastern Oklahoma and western Arkansas.

Another possible exploratory trend has been indicated by wildcat activity in the Hatchett Mountain area of southwest New Mexico.

Southern Michigan and northeastern Ohio also are very much in the plans of some operators.

Other formerly low-priority areas also are getting second looks. These include among others, such regions as the Marfa-Presidio Basin, south of the West Texas province; far southwest Texas, along the Rio Grande; and portions of the Delaware Basin.

Reprints Available

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DEPT/Transportation & Storage

Yes, Nylon Barges Do Work For Oil

The fold-up containers are no longer just laboratory toys. They're now in commercial use as petroleum product carriers—and this could be just the beginning.

The nylon barge has just become an operating oil carrier, with promise of wide application in oil transportation and storage.

Just two years ago, the question was "Will nylon barges work?" (PW—Feb.8'57,p32). At the time, British, German, and American researchers were in the early stages of studying this radically different method of transporting lighter-than-water fluids.

Since then, each group of researchers has advanced steadily in development of a barge suitable for commercial operation (PW—Oct.3'58,p80). Now the answer to the two-year-old question is that the nylon barge not only can work, it has worked:

Esso Petroleum Co., Ltd., has just completed the first commercial marine movement of petroleum products in a 10,000-gal. nylon-rubber "bag" made by Dracone Developments, Ltd., of London.

Esso is the first company to buy the nylon-and-synthetic-rubber barge manufactured by Dracone.

Esso used the new 100-ft.-long, 5-ft.-deep barge to move a cargo of 10,000 gal. of kerosene from its Fawley refinery, on the English south coast, to the company's Isle of Wight storage terminal, about 10 mi. away. The shipment, Esso says, was "a complete success."

The kerosene-bearing "sausage" was towed by a 45-hp. launch, and made the trip in two hours. Cargo was pumped into storage tanks in one hour.

The Esso bag was filled with carbon dioxide for its return trip.

The Esso barge is made of specially-woven nylon, sandwiched between rubber coatings which provide for sealing and for protection against abrasion. Skin thickness is only 0.15 in.

The barge weighs about 2,300 lb. It's designed to be reeled on and off a special 9x5-ft. floating spool. In tow, the barge rides about three-quarters submerged, and can be turned in much less than its own length by forming a fold and moving end-to-end as long as necessary.

The same type of nylon bag is already scheduled for use on an oil carrier in other parts of the world, too.

Dracone says that is has just sold two barges like the one used by Esso for use in West Africa. An oil company bought one, a shipping company the other.

Also, Ernst Doerpinghaus' International Container Co., GmbH, the Hamburg company in the flexible barge race, has been negotiating for American distribution of its product—a nylon bag similar to Dracone's.

And Matson Navigation Co., of San Francisco, says its work on nylon barges, although still in the development stage, is progressing nicely. Matson is concentrating on a blimp-shaped bag which would ride completely submerged.

A Matson spokesman says that his company's flexible barge, when ready, will probably look like a "very fat cigar."

But this could be only the beginning of the nylon bag's impact on oil. Several other oil companies have also shown deep interest in the new container as an inland-waterway products carrier.

This is the prime market, Dracone feels, for the size bag Esso is using.

Dracone says that the 10,000-gal. bag creates only 800 lb. of drag at seven knots in river or harbor water. Three such bags could be towed at that speed by a 60-hp. tug.

Dracone says the cost of the nylon containers would be only a fraction of that of conventional steel barges. Capacity, however, would be considerably less.

If the bag can be made in much larger sizes, several companies would be interested in using it to transport offshore crude to shore.

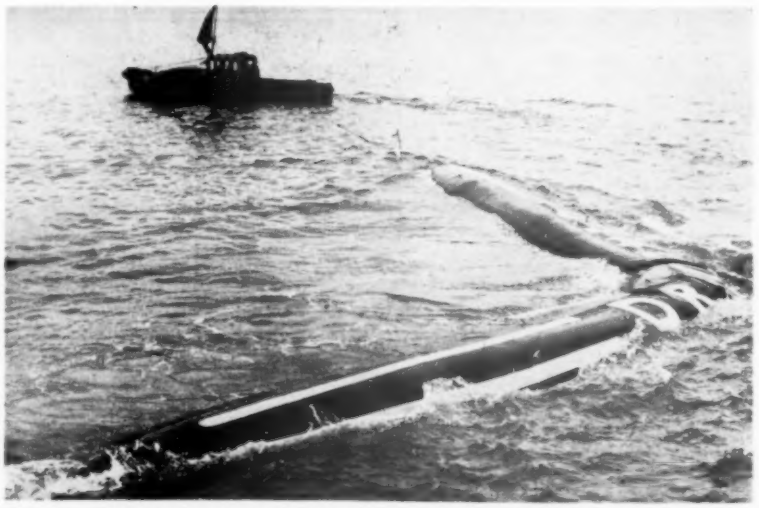
A spokesman for one company now doing considerable production work in the offshore Louisiana area told PETROLEUM WEEK that the nylon barges, if big enough, might be a good replacement for conventional barges now used in this service.

"The bags," he said, "would be easier to handle and would give us a more flexible operation. But they'd have to be much bigger—say big enough to handle, 10,000 bbl."

Dracone says it is working to make bags that will carry up to 1,100 tons (8,250 bbl. of 34-gravity crude), and that bags with carrying capacities up to 10,000 tons (75,000 bbl. of 34-gravity crude) "are feasible on the basis of preliminary study."

There is also a possible storage application for the nylon bag in both offshore and onshore production areas.

Dracone recommends its containers for both. The company says the bags



FIRST COMMERCIAL NYLON BARGE for oil transportation, which looks like this, has just been used for a short distance shipment by Esso Petroleum Co., Ltd.

New Carolina pipeline uses

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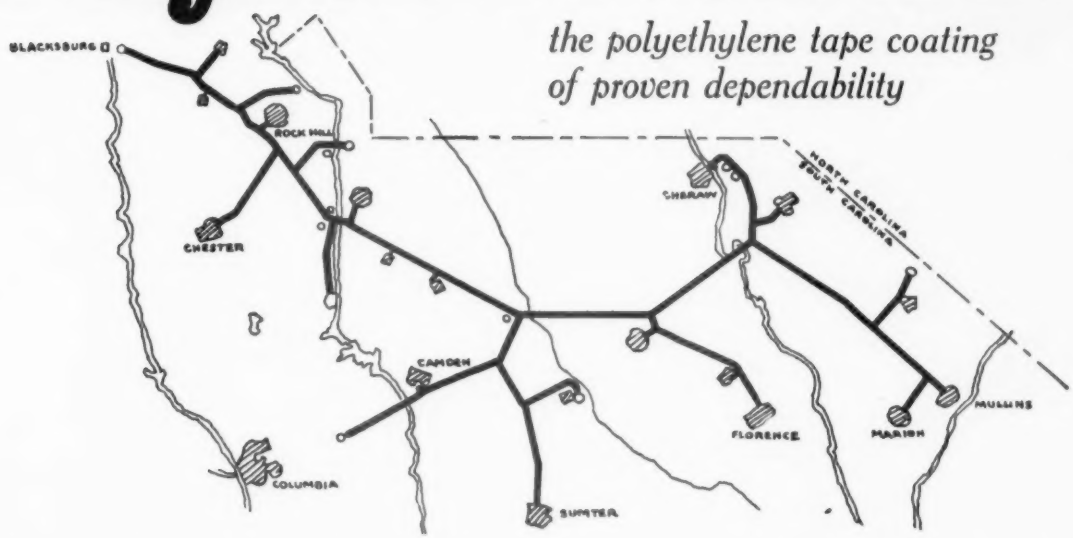
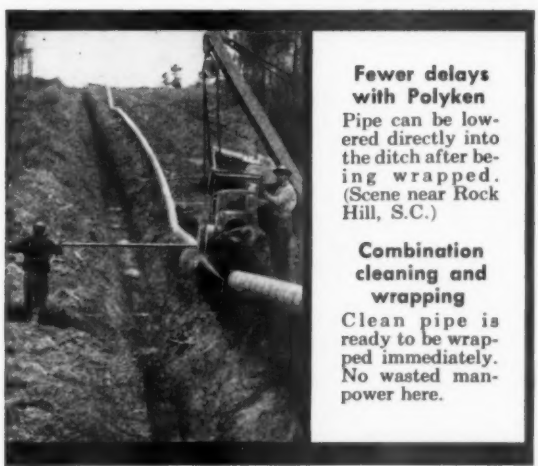


The contractors—Panama Williams Corporation and Buchanan Contracting Company used Polyken Tape for its construction savings in time, labor and handling costs.



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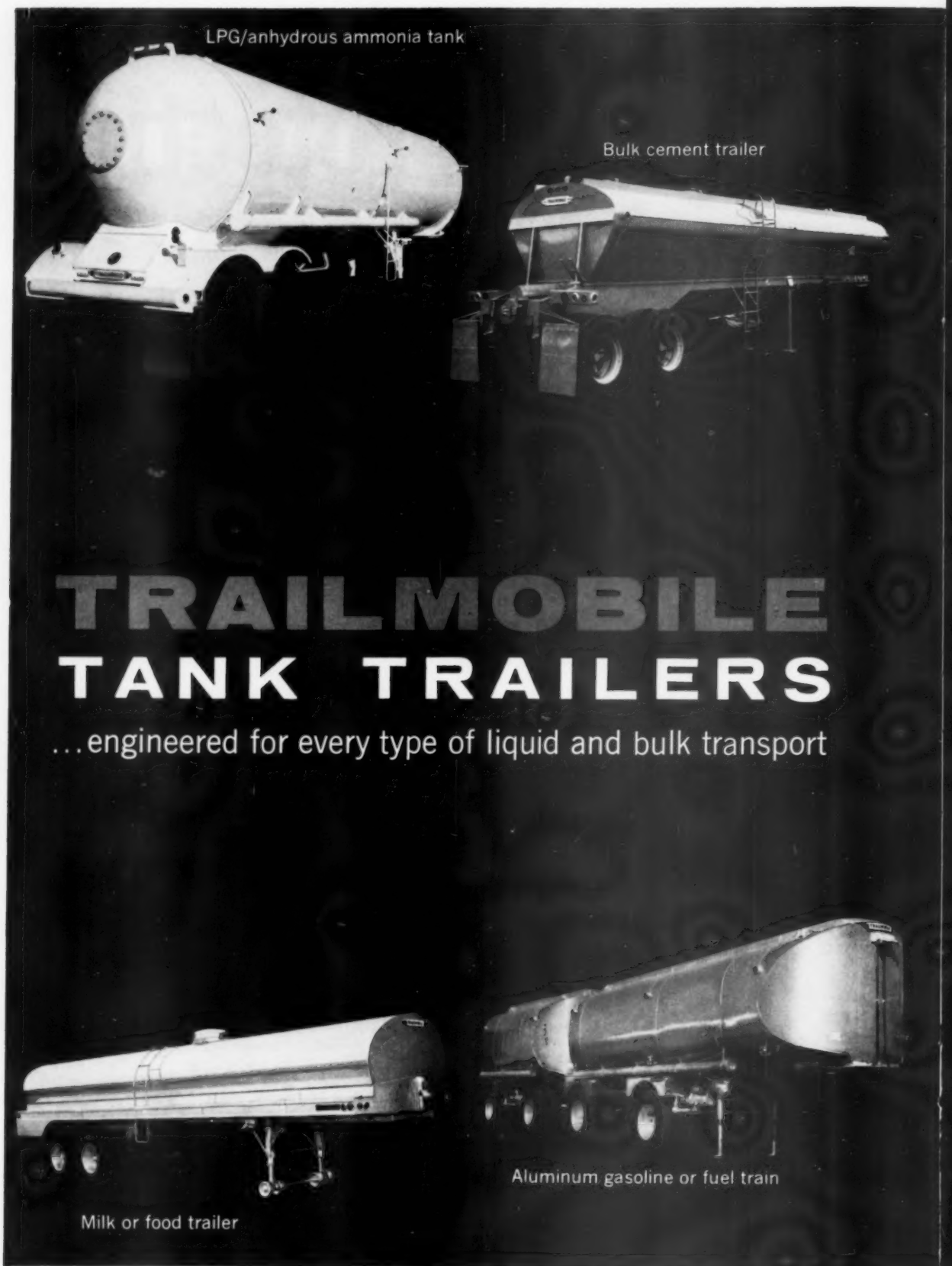
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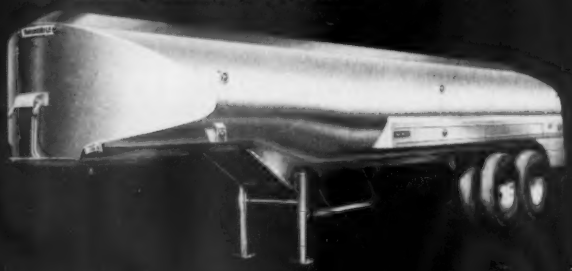

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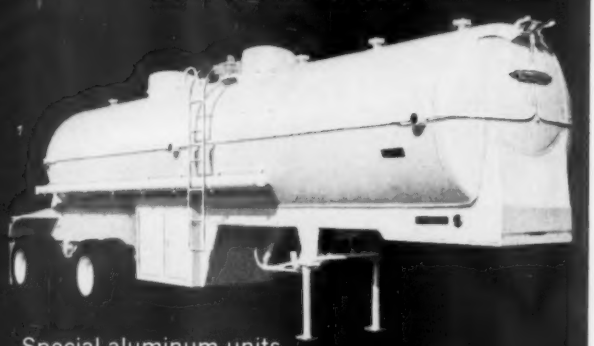
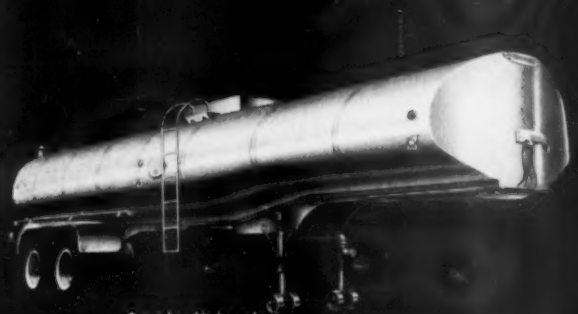
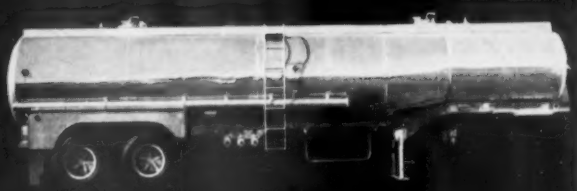


Special aluminum units



Asphalt tank



Casinghead tank (MC-304 type)

can be equipped with hose pipe connections for storage applications.

The representative of another U. S. major told PETROLEUM WEEK that his company is "watching the development of these bags closely." And, he pointed out, "so is everyone else."

This interest, he said, is generated by the possibility of using such containers as storage facilities—for crude or products, onshore or offshore.

More important, however, may be the long-range effect of the flexible containers on the oil business. Down the road, for instance, there is the possibility of long-distance ocean transportation of crude or products in such containers.

A research engineer for one eastern major says his company feels that "nylon barges are only in their infancy. They could have a mighty important bearing on the industry's operation sometime from now. They could very well influence our thinking in several different directions in the decade ahead."

One logical question: "Will the flexible bag ever replace the ocean-going tanker?" Not even Dracone or other flexible-barge makers are ready to claim that much.

First of all, tankers being built today (the 100,000-tonners) can carry up to 1-million bbl. of crude per cargo. Makers of the flexible oil carriers don't even discuss the possibility of making a container large enough to handle even one-tenth of this amount. Even if several of the largest-planned flexibles were operated in tandem, they could hardly approach the 100,000-tonner's carrying capacity.

But chances are they'd be much cheaper—and that's always an important factor.

Dracone and its counterparts in other countries still must prove that flexible fluid carriers—of any size—are seaworthy.

The dynamic behavior of the containers is an extremely complex subject. Although there is some evidence that the nylon barges can withstand the strain of rough seas, and lengthy trips in calm seas, none is ready to call this evidence proof.

Dracone is convinced—and other flexible-barge researchers seem to agree—that, regardless of size, the flexible containers should have a long, slim shape.

Reason: The shape reduces drag considerably. Besides, a long, narrow "tube" is easier to fabricate than containers of most other shapes.

No Major Oil Lines Coming This Year

The Committee for Oil Pipe Lines expects that no major U.S. crude or products lines will be built this year.

Several major U.S. oil pipelines—a few crude lines, a couple of products lines—had been planned for 1959 construction during the latter part of last year (PW—Nov.14'58,p94).

However, one by one, these plans have been postponed or canceled.

The Committee for Oil Pipe Lines said last week, "It is not anticipated that any oil pipelines of major importance will be constructed in 1959."

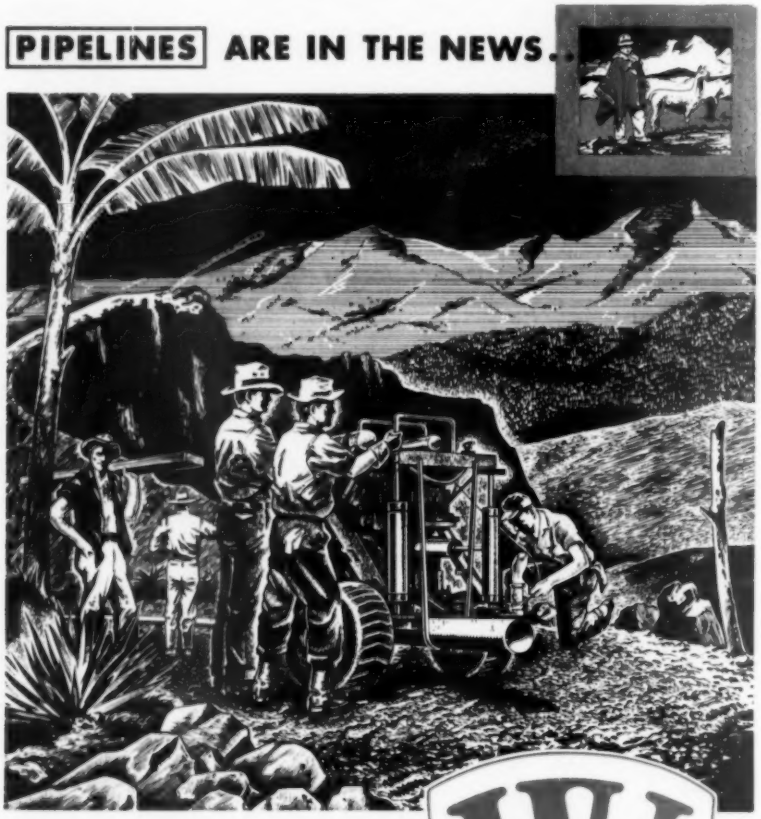
The Committee also reports that 1958 didn't quite measure up to 1957 in terms of new oil pipeline mileage.

According to the committee's figures, 4,127 mi. of principal crude and products lines were completed in 1958, at a cost of $215,612,000.

In 1957, the committee says, oil pipeline construction totaled 5,014 mi., but cost only $199,126,000.

The committee also says that 398 mi. of crude lines were converted to products service last year, as compared with 1,906 mi. of such conversions in 1957.

PIPELINES ARE IN THE NEWS..



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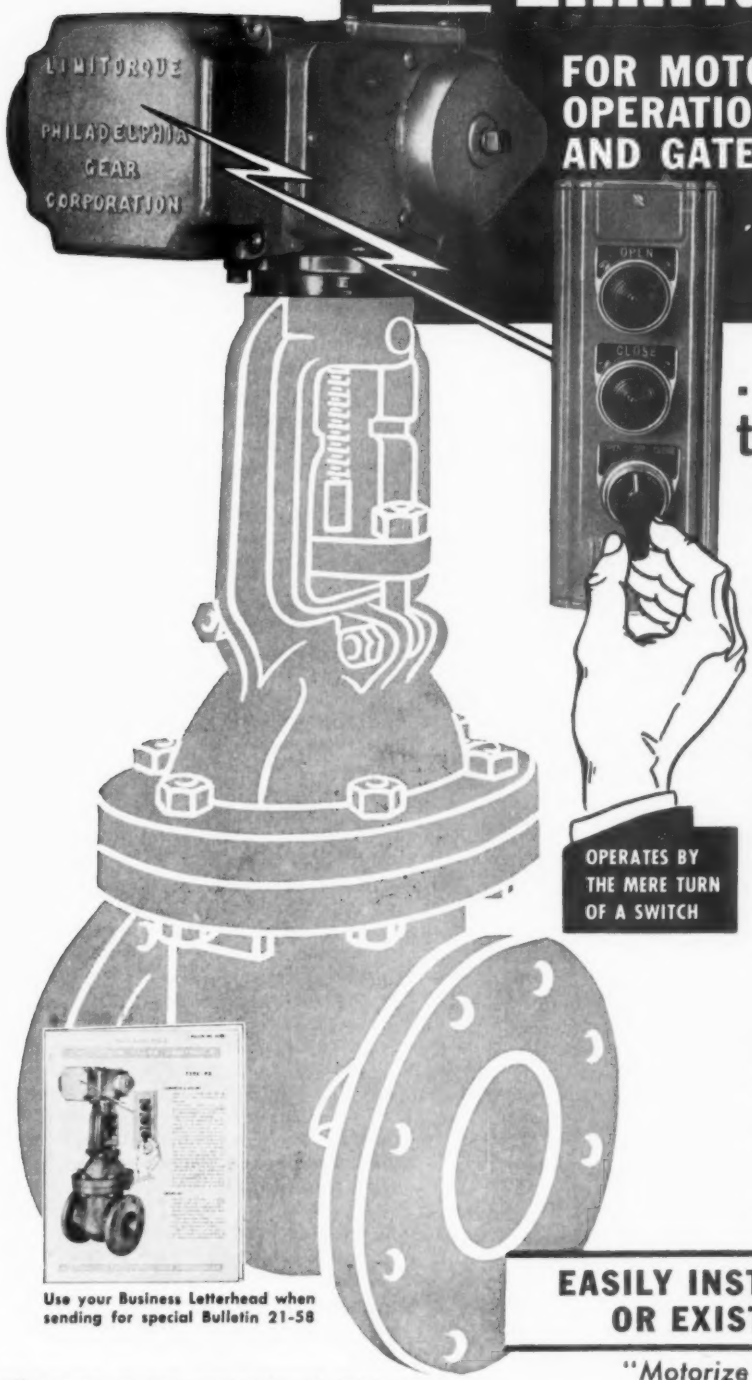

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What's New / IN TRANSPORTATION AND STORAGE

The Russians are reportedly building a plastic oil barge.

Construction of the revolutionary barge is said to be part of a program to use plastics in a variety of vessels. The program is under the direction of the Bureau of the U.S.S.R. River Fleet.

The plastic oil barge would be 106 ft. long and 12 ft. wide, and would consist entirely of plastic, except for its propulsion system, according to the Russian shipbuilders. The hull would be made up of a double layer of "glass plastic" filled with foam plastic.

The barge, which would have four plastic tanks, would use Z-shaped transverse and longitudinal ribs, Moscow says. Construction is expected to begin later this year.

•

South Texas Natural Gas Gathering Co. has begun building its 115-mi. line to link gas production in four South Texas counties with outlets to markets.

Pipe-laying is beginning on the line, part of a 290-mi. system to tie reserves in Brooks, Starr, Hidalgo, and Jim Hogg Counties to major transmission systems heading into midwestern and eastern markets (PW—Jan.30'59, p42).

O. R. Burden Construction Corp. is the contractor. The line is scheduled for completion by mid-Spring.

•

Construction is about to begin on the 55-mi. line to carry jet fuel from Port Everglades, Fla., north of Miami, to Homestead Air Force Base.

The 8-in. system will be built almost entirely on right of way bought from the Florida East Coast Railway. The system is scheduled to be in operation by the end of spring.

Florida Pipeline & Storage Co., which will build and operate the line, originally planned to link Port Everglades and the Miami International Airport, about 30 mi. away (PW—Mar.21'58,p44). Now the line will bypass the Airport (temporarily at least) and serve Homestead directly.

•

The Annual Tanker Conference of the American Petroleum Institute's Transportation Division will be held in New Orleans, Apr. 15-18.

Tanker corrosion and offshore operations will be the subjects of symposiums. "The Tanker Outlook" and "The Longitudinal Strength of Large Tankers" will also be discussed.

•

Alberta Gas Trunk Line Co., Ltd., will begin construction on its $23-million 1959 expansion program in mid-April.

The Calgary-based company plans to construct a major gas-gathering system in central Alberta to feed Trans-Canada Pipe Line Co.'s transmission system to eastern markets.

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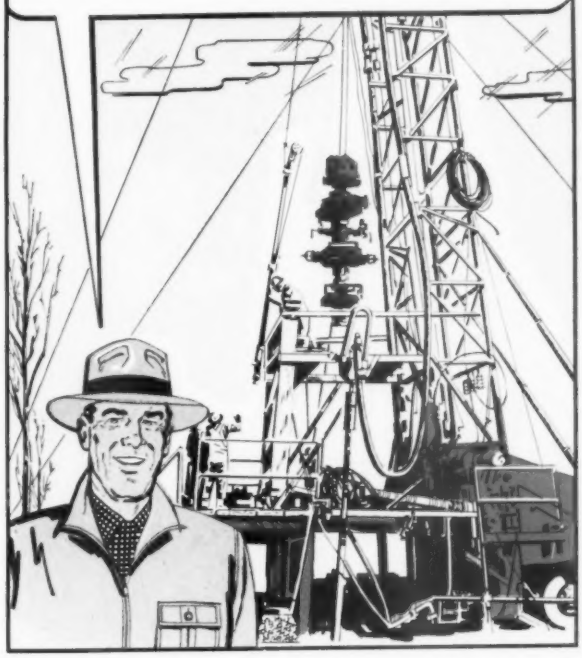
...here's how!



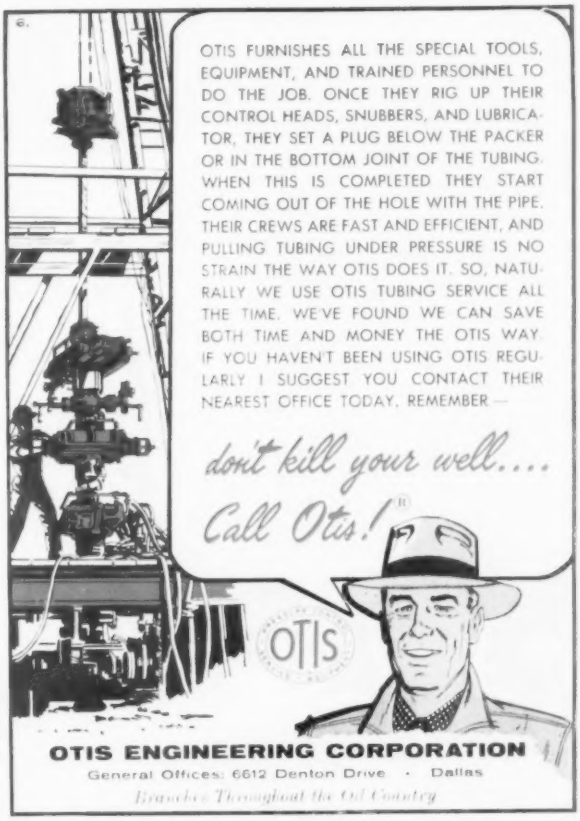
WE'VE GOT A 6,000-FOOT DUAL-PRODUCER HERE THAT IS EITHER LEAKING AROUND THE PACKER OR HAS A HOLE IN THE TUBING. AT LEAST SOMETHING WENT WRONG BECAUSE WE HAD A SUDDEN PRESSURE DROP ON THE LOWER ZONE AND AN INCREASE IN PRESSURE ON THE UPPER ZONE. IN EITHER EVENT, WE'RE GOING TO HAVE TO PULL THE TUBING.

OTIS' CHARGES TO ROUND-TRIP THE TUBING UNDER PRESSURE WILL FIGURE ABOUT $2,800.00 — EXCLUDING RIG COSTS.

6...12 hour days
or 72 hours as follows:
The first 40 hours...$1600.00
32 hours at 30.00 an hour 960.00
Mileage charges are
80 mi/hs at 75¢ per mile...60.00
Wire line work to plug
tubing and remove plug...170.00
$2,790.00

OUR DISTRICT PRODUCTION SUPERINTENDENT'S OFFICE ESTIMATES IT WOULD COST AROUND $4,400.00 TO KILL THIS WELL WITH MUD — EXCLUSIVE OF RIG COSTS. THESE FIGURES ARE BASED UPON COMPLETING THE JOB WITHOUT RUNNING INTO TROUBLE, OF COURSE.

Oil base mud.....$2200.00
Pump truck to kill well..580.00
Steel mud pits.....100.00
Reserve pits.....100.00
Swabbing.....200.00
Extra mixing and pump
time to handle
oil base mud.....1200.00
$4,380.00



OTIS FURNISHES ALL THE SPECIAL TOOLS, EQUIPMENT, AND TRAINED PERSONNEL TO DO THE JOB. ONCE THEY RIG UP THEIR CONTROL HEADS, SNUBBERS, AND LUBRICATOR, THEY SET A PLUG BELOW THE PACKER OR IN THE BOTTOM JOINT OF THE TUBING. WHEN THIS IS COMPLETED THEY START COMING OUT OF THE HOLE WITH THE PIPE. THEIR CREWS ARE FAST AND EFFICIENT, AND PULLING TUBING UNDER PRESSURE IS NO STRAIN THE WAY OTIS DOES IT. SO, NATURALLY WE USE OTIS TUBING SERVICE ALL THE TIME. WE'VE FOUND WE CAN SAVE BOTH TIME AND MONEY THE OTIS WAY. IF YOU HAVEN'T BEEN USING OTIS REGULARLY I SUGGEST YOU CONTACT THEIR NEAREST OFFICE TODAY. REMEMBER —

don't kill your well....

Call Otis!®

BESIDES THE INITIAL CASH SAVINGS WE'LL MAKE BY USING OTIS TUBING SERVICE, WE'RE ELIMINATING THE POSSIBILITY OF FOULING UP THE PRODUCING FORMATIONS WITH MUD. ON A FEW OCCASIONS, WE KILLED A WELL BECAUSE WE THOUGHT IT WOULD REDUCE OUR WORKOVER EXPENSES — BUT BY THE TIME WE GOT THROUGH CLEANING UP THE FORMATIONS TO BRING PRODUCTION BACK, OUR COSTS HAD SKYROCKETED. ONE OR TWO TIMES THE WELL NEVER DID COME BACK TO FULL PRODUCTIVITY.

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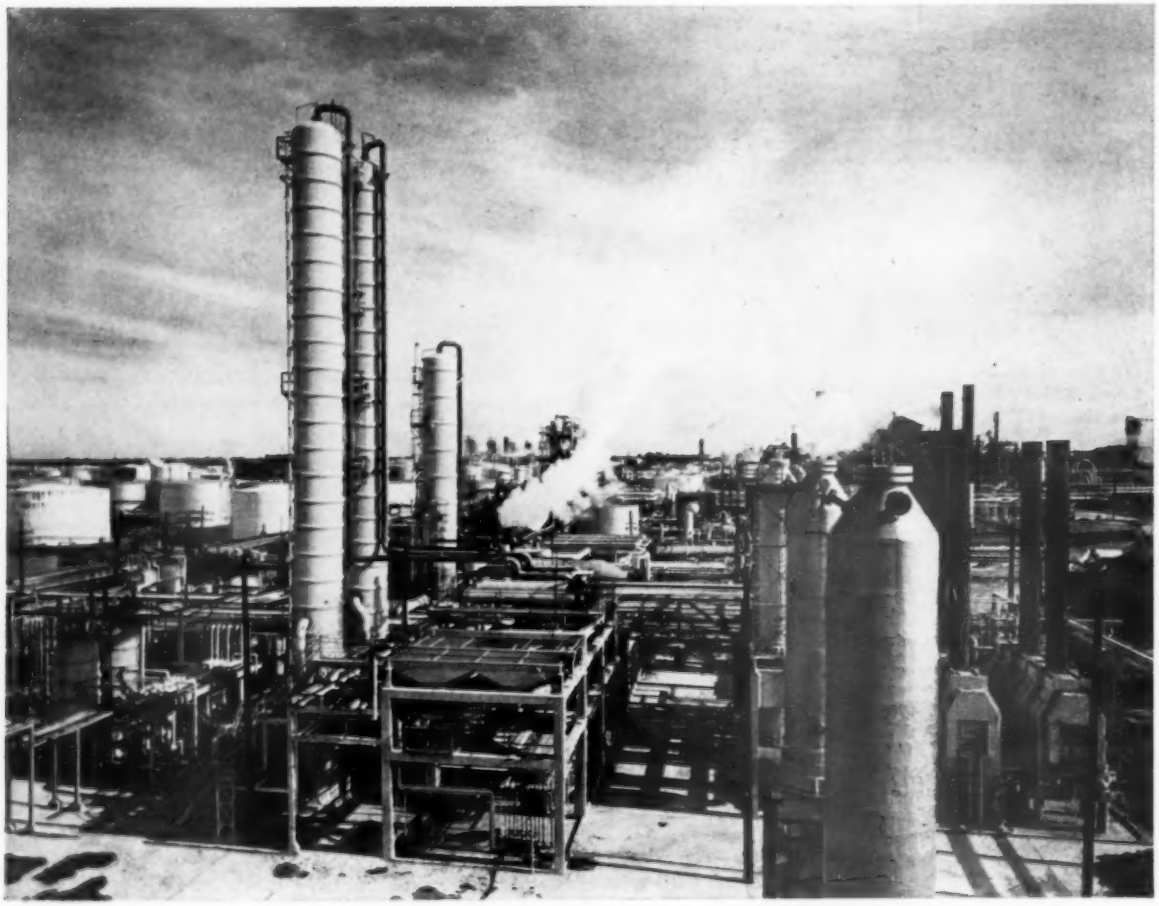

HYDROFINING REPLACES ACID TREATMENT

To eliminate pollution of air and effluent water, reduce operating costs, and to produce a sulphur free finished product, a large Gulf Coast refiner recently placed in operation the above pictured 6000 barrel per day HYDROFINING Unit designed to supplant acid treatment in processing close boiling range naphthas.

Feed stock is vaporized and mixed with hydrogen which catalytically reacts with sulphur contained in the feed stock mostly in the form of mercaptans, to form hydrogen sulphide which is further processed to recover elemental sulphur. After HYDROFINING the liquid product is washed with caustic and filtered through charcoal.

HUDSON furnished mechanical design, materials and equipment; and constructed the HYDROFINING Unit and the Fractionating Unit shown at the left of the picture.

The services of the HUDSON organization, with over 25 years experience in process design, mechanical design and construction are available to process industries in any part of the free world.

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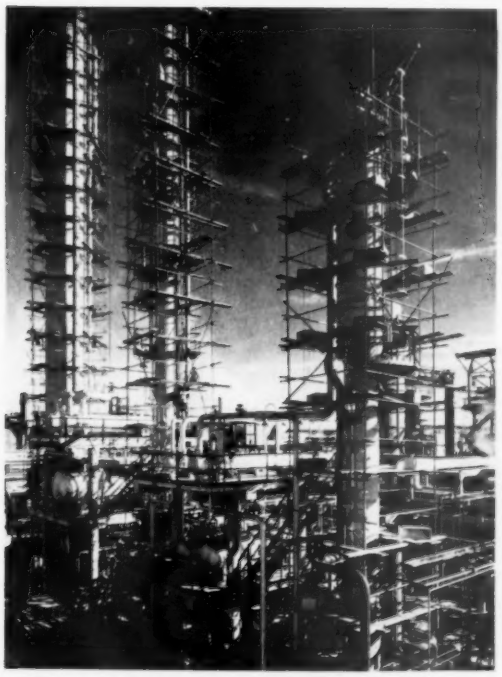

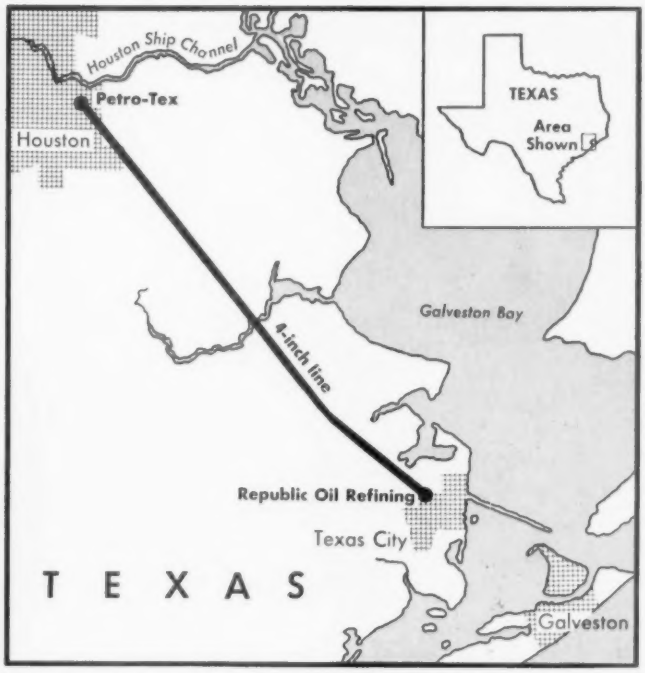

THIS NEW ALKYLATION UNIT now on stream at Petro-Tex Chemical Corp.'s Houston plant "shares" its 3,000 b/d of alkylate output between Petro-Tex and Republic Oil Refining Corp., at Texas City, Tex., in a novel arrangement as . . .

Two Companies Share Alkylation Unit

A giant stride for a small refiner trying to keep up with octanes has been reached with the completion of an alkylation unit, for the joint use of Republic Oil Refining Corp. and Petro-Tex Chemical Corp. at Petro-Tex's Houston plant.

The 3,000 b/d unit is now on stream after a year of construction. It marks a unique agreement between Republic Oil, a petroleum refiner, and Petro-Tex, a petrochemicals and chemicals manufacturer, to share the benefits of an alkylation unit. Petro-Tex built, financed, and operates the unit; Republic, in effect, "rents time" on it.

Republic Oil, a division of Plymouth Oil Co., has a 45,000 b/d refinery at Texas City, Tex. The plant is equipped with a 15,500 b/d UOP fluid catalytic cracking unit, a 6,800 b/d UOP Platformer, and a 1,000 b/d poly gasoline unit to make gasoline octanes. But there is no alkylation unit at the refinery.

Petro-Tex, jointly owned by Tennessee Gas Transmission Co. and Food Machinery & Chemical Corp., is a substantial producer of butadiene. The company's Houston plant has a capacity of 200,000 tons a year of butadiene.

The two companies have a long-term agreement for Republic to furnish Petro-Tex half the feedstock needed to make the alkylate.

In return for the feedstock, Republic receives half of the alkylate produced. It also pays a specific amount for the processing of this alkylate.

Republic Oil's share of the alkylate feedstock, a butylene-butane-isobutane stream, is delivered to the Petro-Tex plant through a converted 4-in. pipeline owned by Petro-Tex.

Petro-Tex matches Republic Oil's feedstock with butylene from its own Houdry butane dehydrogenation units, and with purchases of isobutane from other sources.

Republic Oil, a long-time supplier of butylene-butane streams to the Houston butadiene plant now owned by Petro-Tex, was in danger of losing this market in 1957 when Petro-Tex installed its Houdry butane dehydrogenation units to make its own butylenes.

The Houston butadiene plant was completed in March, 1944, as part of the war-time emergency program to make synthetic rubber. At that time, two 4-in. pipelines were built to carry raw materials to the plant from the Republic Oil and American Oil refineries in Texas City. (One of them has since been scrapped.)

Sinclair Rubber, Inc., a subsidiary of Sinclair Refining Co., operated the Houston plant from 1944 until its sale to Petro-Tex in 1955 by the Rubber Producing Facilities Disposal Commission.

Republic Oil continued to supply butylene-butane streams to Petro-Tex until completion of the Houdry units in 1957, which gave Petro-Tex its own supply of butylene. This meant that Republic Oil no longer had a "home" for its butylene-butane streams.

For Republic Oil, the alkylation arrangement with Petro-Tex is a way to protect its market for butylenes and butanes and, at the same time, to stay in the climbing octane race.

"Our reason was two-fold for getting into this venture," explains C. H. Barre, vice-president of refining of Republic Oil.

"First, we had a feedstock we had to do something with. Second, we thought alkylation would bring the best sort of return.

"Actually, while we don't market products under our own brand, we've got to be prepared to stay in the

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octane race and provide the highest-quality gasoline, to remain competitive. This particular alkylate is excellent for upgrading motor gasoline. Also, until it's needed for motor gasoline, we have a good use for our alkylate in blending avgas.

"We are continuing to do something we've done for years. That is, we are shipping feedstock to the plant in Houston. The only difference is that we are now receiving alkylate in return for our feedstock."

Republic says, however, that this alkylation agreement won't necessarily mean the difference between operating at a profit or at a loss.

But, Barre says, "Both firms thought they could justify the expense on the basis of economics."

Gordon Cain, vice-president of Petro-Tex, adds, "Putting the two streams together was clearly to the advantage of both firms."

Republic Oil uses its share of the alkylate for avgas, while Petro-Tex sells its share.

Alkylate from Houston is returned to Republic Oil in Texas City on regular gasoline-type barges. Once it reaches the refinery, it is blended to make a 115/145-grade aviation gasoline for sale to the government. Petro-Tex's share of the alkylate is sold to other refiners in the area.

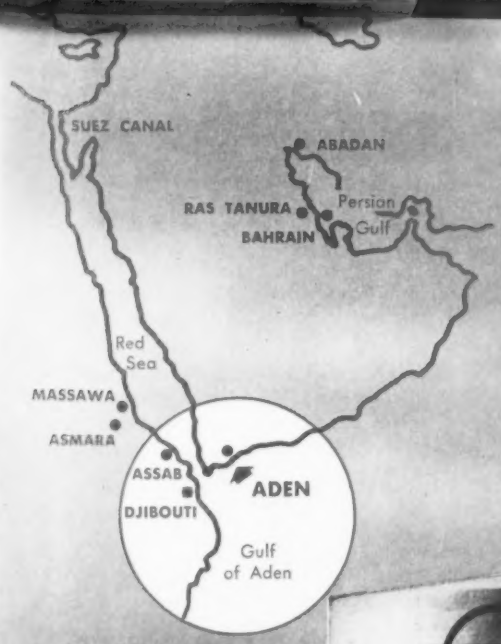
The alkylation process used at Houston is a Stratco Effluent-Refrigeration type.

This process is actually a modification of conventional sulfuric-acid alkylation, but uses refrigeration to maintain a high isobutane-butylene feed ratio in the alkylation reactor.

Cool reactor effluent is used as the refrigerant to keep the reaction temperature down to about 45F to 50F, and, at the same time, to separate isobutane from the reactor effluent for recycling.

In the reactor, fresh butylene feed is reacted with isobutane by contact with sulfuric acid (the catalyst) in a liquid-phase reaction. Reactor pressure is held at 40 psig. or higher in the reactor and the settler. From the settler, reaction effluent is discharged to a suction trap, in which the pressure is regulated to 3 to 5 psig.

Evaporation of part of the isobutane in the suction trap cools the remainder of the isobutane to 20F to 30F. The cooled isobutane from the suction trap passes through the coils in the Stratco reactor, cooling the reaction mix and evaporating more isobutane. The isobutane vapors are separated from the liquid, compressed, and depropanized before recycling to the feed along with fresh isobutane from conventional fractionation.



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Lube Makers Challenged

The oil and auto industries need greater understanding of each other's "lubrication problems," in the opinion of O. C. Bridgeman, of Phillips Petroleum Co., and V. G. Raviolo, of Ford Motor Co.

Changes in engine design "must be of a gradual nature" if the oil industry is to have enough lead time to develop and test the new lubricants required for these engines, Bridgeman, who is technical consultant to Phillips' research division, told the 10th annual winter meeting of the Lubrication Committee of the American Petroleum Institute's Marketing Division, in Chicago.

As for the automobile makers' attitude, Raviolo, special assistant to the vice-president of Ford's engineering and research staff, at Dearborn, Mich., told the meeting that the oil industry must provide auto manufacturers with a "simple method of telling the public how to buy oils.

The biggest problem is in matching high-quality lubricants with constantly improving engines.

Said Bridgeman: "The peak at which modern engines now exist is so high that it is difficult to think of any major design changes which will not affect in some degree the lubrication requirements.

"Thus, the recent trend toward high-horsepower engines, with their marked degree of over-cooling in many cases under the most usual type of driving conditions, has resulted in a severe aggravation of the low-temperature sludge problem."

Lubricant manufacturers need more advance notice of engine changes being made by engine designers, Bridgeman said.

The oil industry needs, at the very least, six months to develop and test new motor oils before putting them on the market as reliable products, and the usual time needed is closer to two years, according to Bridgeman.

The special requirements for severe-service lubes are such that it is a formidable task to develop a new motor oil, particularly of the multigrade type. The compatibility of six or more different base stock and additive components must be determined through extensive laboratory and field tests.

"It is not at all infrequent for a formulation to be satisfactory in test after test covering a period of months, only to show deficiencies as the final tests are approached," Bridgeman said.

And during this period of developing a new lube, engine designers for the automobile manufacturers often come up with engine modifications requiring even more advanced lubricants.

But automobile manufacturers can't give prototype models of all new engines to all oil companies, Raviolo said.

Though he agreed that it would be desirable to give all oil companies more advance notice of engine changes, Raviolo pointed out that prototypes of new engines are handmade, and cost from $10,000 to $25,000 each.

Regardless of the cause, however, classifications of motor oils are confusing to the purchasing public, and so-called "severe-service" motor oils sometimes do not come up to expectations, Raviolo charged.

The biggest problem is in the Service MS Oils, those submitted to the most severe types of usage—stop-and-go driving and high-temperature engine operation. Because of these severe conditions, the oil must be formulated to consider not only mere

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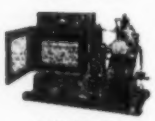

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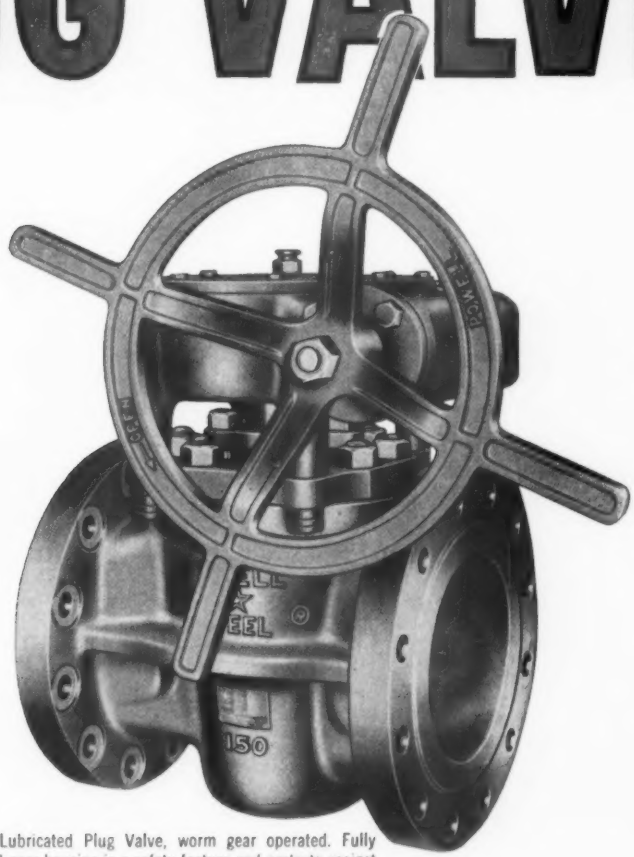

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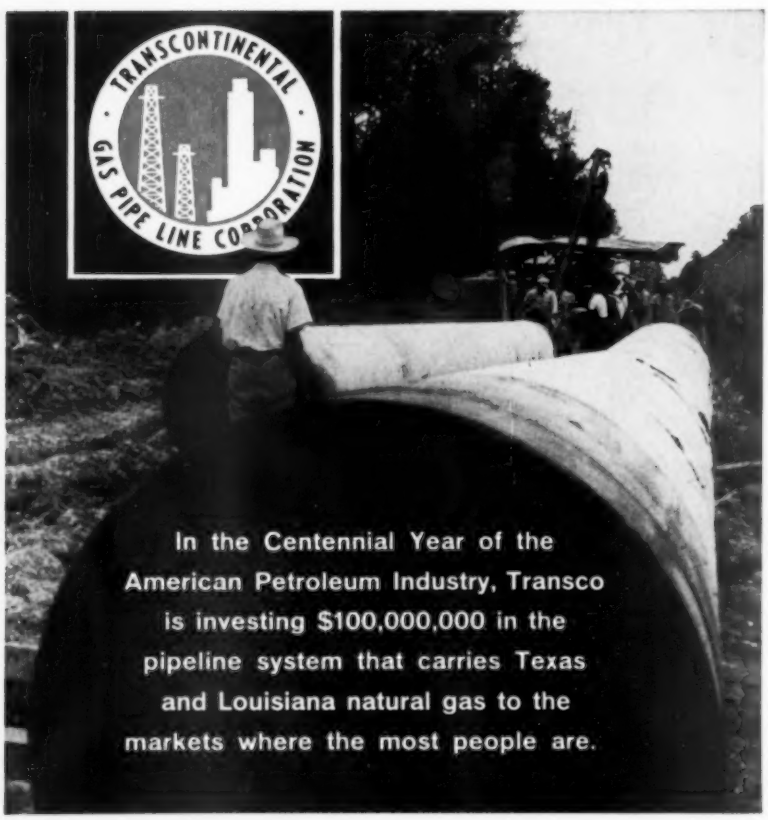
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In the Centennial Year of the American Petroleum Industry, Transco is investing $100,000,000 in the pipeline system that carries Texas and Louisiana natural gas to the markets where the most people are.

lubrication, but also engine deposits and engine-bearing corrosion.

But the average motorist does not know when to request a Service MS oil. If the oil industry cannot adopt more realistic tests and classifications, auto makers may have to issue lists of approved oils, or even purchase oils on specification to sell themselves, Raviolo said.

Indiana Standard Gets Missile Job

Standard Oil Co. (Ind.) will participate in the development of the Air Force's Minuteman, the first all-solid-fuel intercontinental ballistic missile.

Standard's role in the Minuteman, based on a contract negotiated with the Air Force, is a continuation of solid-fuels research begun by the company in 1951.

Standard's part of the Minuteman program will be to develop solid-fueled gas generators for auxiliary power units on the missile.

The gas generator is a unit that is similar to a rocket, but whose prime purpose is to generate gases over a long period of time, rather than thrust. The gases drive turbines and other power-transmitting devices used to operate the equipment that directs the missile to its target.

Both the solid fuel and the metal parts to contain and control the burning of the fuel will be developed by Indiana Standard, stated Dr. P. C. White, general manager of research and development for the company.

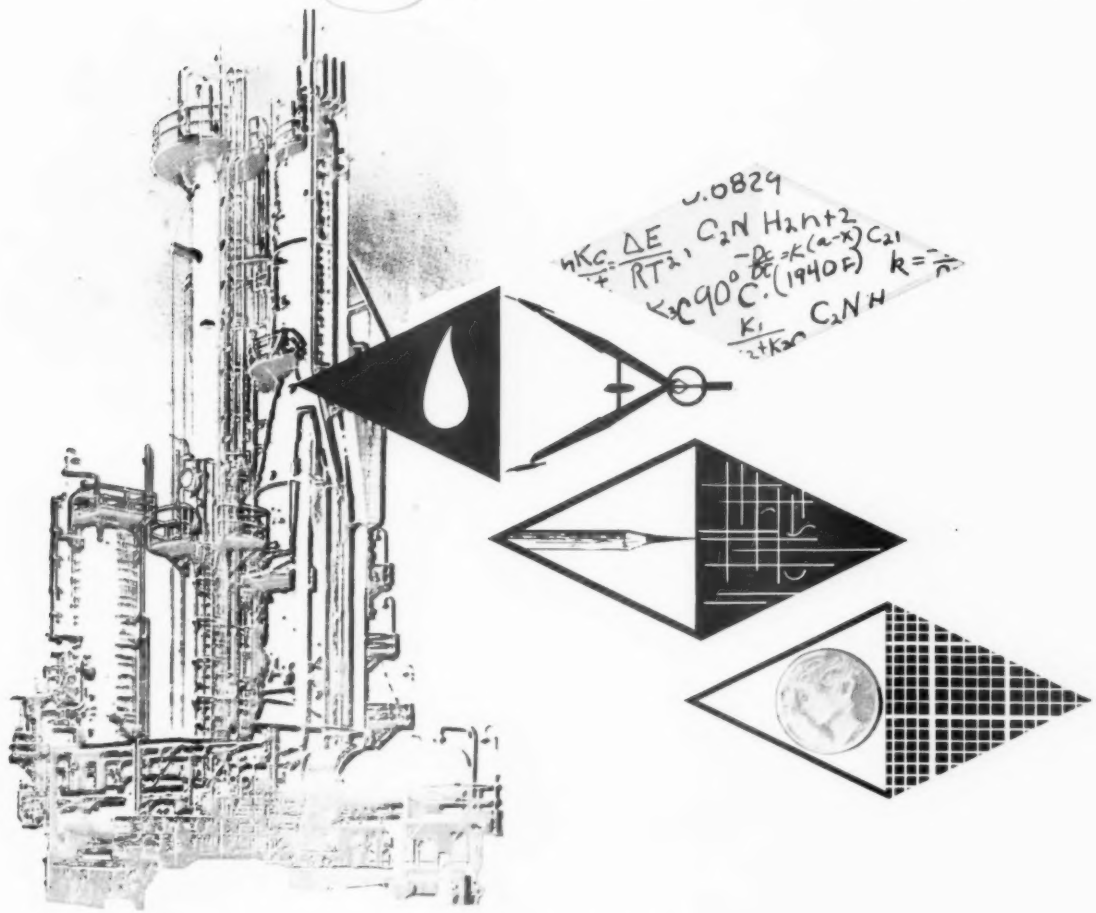
Gas generator work for military missiles is not new to the company. White announced last August that it was developing a solid fuel for use in an auxiliary-power gas generator unit for the air-to-air Falcon missile.

The solid fuel developed by Indiana Standard uses a thermoplastic binder. The company says it is clean-burning, with a low flame-temperature, well-suited to gas generator use.

Six other companies are involved in the Minuteman project, with Boeing Airplane Co. as the prime contractor.

Thiokol Chemical Corp. and Aerojet-General Corp. will furnish the engines. Avco Mfg. Corp. will design and build the nose cone. Autonetics Division of North American Aviation has responsibility for the missile's guidance system. And Thompson-Ramo-Wooldridge Products Co. will supply technical advice.

intangibles were never so important



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You get the easiest, quickest delivery of heavy-duty trucks from Dodge, too, through Dodge's growing network of Truck Centers. Ask your Dodge dealer about it. He has dozens of big, powerful reasons why . . .

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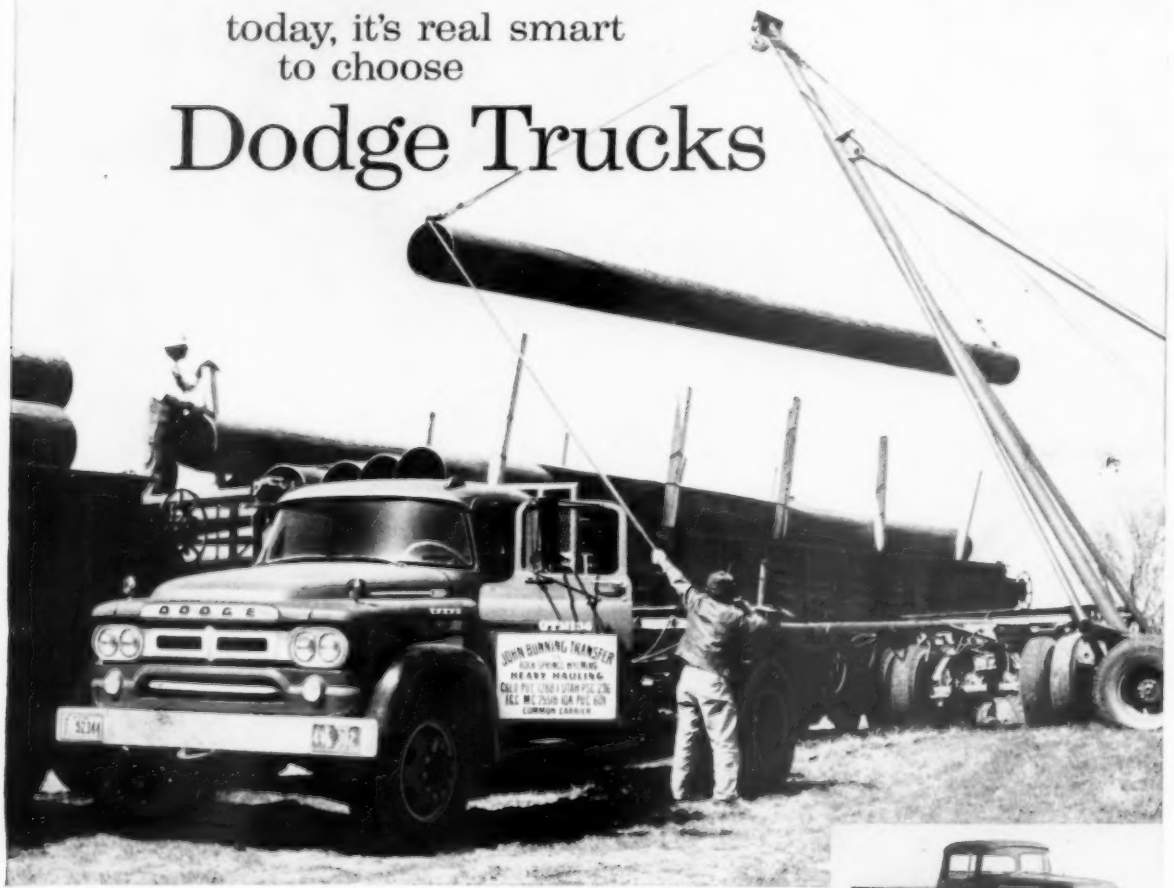

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What's New / IN PROCESSING AND PETROCHEMICALS

Sun Oil Co. will build a product control center at its Marcus Hook (Pa.) refinery as a part of the automation program it is undertaking with Genesys Corp. (PW—Feb.27 '59,p28).

The $100,000 product control center will collect plant operating data and will continuously monitor quality variances in product streams.

The center will be located at a 60,000 b/d unit of the refinery, which includes cat cracking, crude and vacuum distillation, visbreaking, and gas processing operations. Information will be gathered by viscometers, continuous chromatographs, boiling range indicators, density transmitters, colorimeters, and other instruments to be developed.

•

Universal Oil Products Co. and Daystrom, Inc., report a successful pilot plant application of the "first computer-operated control system for continuous processing."

The computer-controlled pilot plant resulted from several years of coordinated activity by UOP and Daystrom.

The two companies announced that electronic-computer control systems using their technical knowledge will be offered to the industry by Daystrom.

•

Bay Petroleum Co. will build a gas processing plant on Copano Bay, 8 mi. northeast of Rockport, Tex.

The plant will process 50-million cf/d of natural gas feed. It will produce a mixed stream of 32,800 to 42,000 gal. a day of propane, normal butane, isobutane, and natural gasoline. The plant's entire output will be delivered to Bay's liquid hydrocarbons fractionating plant near La Porte, Tex., via a 12-mi., 4-in. pipeline to be built from the Copano Bay plant and connecting with a products pipeline Bay operates along the Texas Gulf Coast.

Construction will begin this month, with completion due this fall. O. L. Olsen Co., Houston, is the contractor.

•

A contract has been awarded for a gas processing plant for the Nevis Operators' Committee at Nevis, Alberta.

The plant will yield approximately 43-million cf/d of gas and, as a by-product, approximately 125 long tons of sulfur a day.

Construction will begin in late April, with completion scheduled for November. Process engineering and construction will be handled by Fluor Corp., Ltd., Los Angeles.

•

Carter Oil Co. has plans for an asphalt-emulsification plant and a revamp of the road-oil plant at its Billings (Mont.) refinery.

The capacity of the new asphalt plant will be about 7,000 gal. an hour of emulsified asphalt in two grades—rapid set (RS) and slow set (SS).

The two jobs are an extension of a building program already under way at Carter's 34,000 b/d refinery. Other projects include a 2,300 b/d HF alkylation unit, a light-ends debutanizer, and remodeling of a 9,220 b/d bauxite-catalyst desulfurizer into a 10,275 b/d naphtha Hydrofiner.

The Refinery Engineering Co., Tulsa, is handling engineering, purchasing, and construction of the projects. The alkylation unit and the light-ends debutanizer are now over 50% completed.

•

American Oil Co. has given Ionics, Inc., of Cambridge, Mass., exclusive rights to commercialize Amoco's membrane permeation process for separating liquid mixtures (PW—Apr.18'58,p40).

The process was developed in Amoco's research and development labs in Texas City, Tex. It uses a thin, nonporous plastic membrane to separate a given component from a liquid mixture. Separation is based on preferential solubility in the membrane by one component of the liquid mixture.

The process is now ready for commercial application in petroleum refineries and chemical plants, according to W. S. Peeler, vice-president in charge of manufacturing for L. A. Rupp, vice-president and general manager of Ionic.

It promises to be simpler and more economical than many processes now used for difficult liquid separations, they say.

•

A newly formed company, Texas American Asphalt, plans to produce asphalt from imported Venezuelan crude at two plants to be built in Texas.

Disclosure of the plans came during a hearing by the Rail Freight Bureau, at Dallas, on a request by Texas American for reduction in freight rates from Texas coastal points to the new plants. The plants themselves are to be located at Ennis, 33 mi. south of Dallas, and at La Coste, near San Antonio.

Anchor Petroleum Co., Dallas, is to market the asphalt and handle shipping of crude to the plants.

J. A. Clements, head of the new company, said that Creole Petroleum Corp. would furnish the crude, which he described as a wax-free asphaltic type not available in Texas.

•

U.S. petrochemical activity in Argentina got a boost through announcements that two companies will start construction in Argentina's Comodoro Rivadavia area, where U.S. oil companies are participating in the development of new oil and gas reserves.

Butadiene & Chemical International, Ltd., of Houston, will invest between $40-million and $67-million for facilities to produce 30,000 tons a year of butadiene, 15,000 tons a year of lampblack, and enough styrene to produce 40,000 tons a year (later 60,000) of synthetic rubber. The Argentine state oil company also has the option to require construction of a gas liquids recovery plant in the area.

Under the contract terms, the Houston company is to start the butadiene, styrene, and lampblack plants simultaneously—as soon as possible. During the first three years, the company will remit no profits abroad, and during the ensuing five years, 60% of earnings will be frozen in Argentina.

The second company, Industrias Plasticas Argentinas Koppers, S.A., a cooperative effort by Koppers Co. and Argentine industrialists, announced plans this month to build a $17-million, 15-million-lb.-a-year ethylene-polyethylene plant near Buenos Aires, to go into service during 1961.

Completing the picture, Fish International offered, earlier this year, to invest over $40-million in a synthetic rubber plant in Argentina.

"Computers are a valuable tool for broader research into human relations"

Dr. Carl H. Rush, Jr.,
Standard Oil Co. (N. J.)

How Jersey Keeps Technology Human

The great problem of seeing that concern with human needs keeps pace with the growth of technology is being attacked by Standard Oil Co. (N. J.), with a giant electronic computer.

Carl H. Rush, Jr., a Ph.D. in psychology, and a staff of psychologists in the research section of the employee relations department are designing a system that can be programmed for the company's IBM 705 computer. The computer will then be able to give pertinent answers to a wide range of questions to which Jersey management needs answers.

Generally, the computer will help the personnel research section find out how Jersey employees work within the company, and with each other.

The operations sections of the employee relations department also use the computer for the routine task of recording personnel records.

The computer will make it more certain that qualified people are not overlooked for promotion from within the Jersey organization.

Before data processing, going through personnel records to find all employees with needed qualifications for a specific job was actually impossible.

"Many were overlooked that quite possibly had the requirements for the job," says Rush, "But now, the computer can pick out everyone from the Jersey organization who has the necessary requirements."

After the computer lists all who are qualified, further selection processes can be used to pick the man to be promoted.

Education and training background, medical history, and the causes of absenteeism will also be analyzed with the computer.

For example, if a few district sales managers in the marketing department are doing outstanding jobs, management would like to know what makes them do a better job than the others in the department. The research section would then use the computer to correlate the background and work histories of this group.

The computer, ideally, searches the entire file, and picks up details about their experience that could not be found any other way. And then, management could perhaps duplicate the experience that these men have had in a training course.

Dr. Rush and the staff would like to see each affiliate with its own personnel research facilities. At least 20 affiliates now have small staffs doing research in human relations. In most cases, however, the staff consists of only one psychologist, compared to five with the parent company.

The affiliates that do not have trained people of their own can come to the parent company with their problems.

"Many times when we are visiting an affiliate at the request of its management, we will notice problems that the affiliate is not aware of," Dr. Rush told PETROLEUM WEEK. "Then we will make recommendations for research that will help straighten out the problem."

Once a year, personnel research men from all segments of the Jersey organization meet for a communications session. These professionals in the field of social science can then swap techniques and project any new ideas.

"But," says Rush, "probably the most important feature of this session is the progress report that the research sections submit jointly to top management."

Recently, Jersey's research section made an attitude survey of 4,000 employees in the Jersey organization who are located in New York City.

Participants in this study were employees at Esso Standard Oil Co. and Jersey itself. After the results were tabulated to show the general attitudes of the employees to specific working conditions, participants met in a series of small groups to discuss the findings. These meetings were held in the different departments to try to work out some of the problems revealed.

Group dynamics—the study of how people work together, and how to get them to work better together—

is an important concern of Jersey's employee relations department.

The group discussions that followed the New York attitude survey, Rush says, were a good example of group dynamics in action.

But the subject is far broader than this. In job situations where a small group of employees must work together constantly toward the solution of a common problem, it is extremely important to be sure that the men are congenial, and that their skills are complimentary. If either of these two criteria is lacking, loss of efficiency is bound to result.

Selection of members of drilling teams, or of work teams in other divisions of the company, or selection of members of management committees, are areas in which group dynamics plays a big part, Rush says.

The research section in New York is making early recognition of management ability one of its pet projects.

To develop an adequate background study of management ability, Dr. Rush's staff interviewed Jersey's top management for information that could be used to indicate management potential. Every executive in this group was interviewed and tested for eight hours.

New tests are also being devised to get an adequate description of a potential manager's make-up. Along with these new tests and the background survey, the research staff plans to evaluate existing training programs.

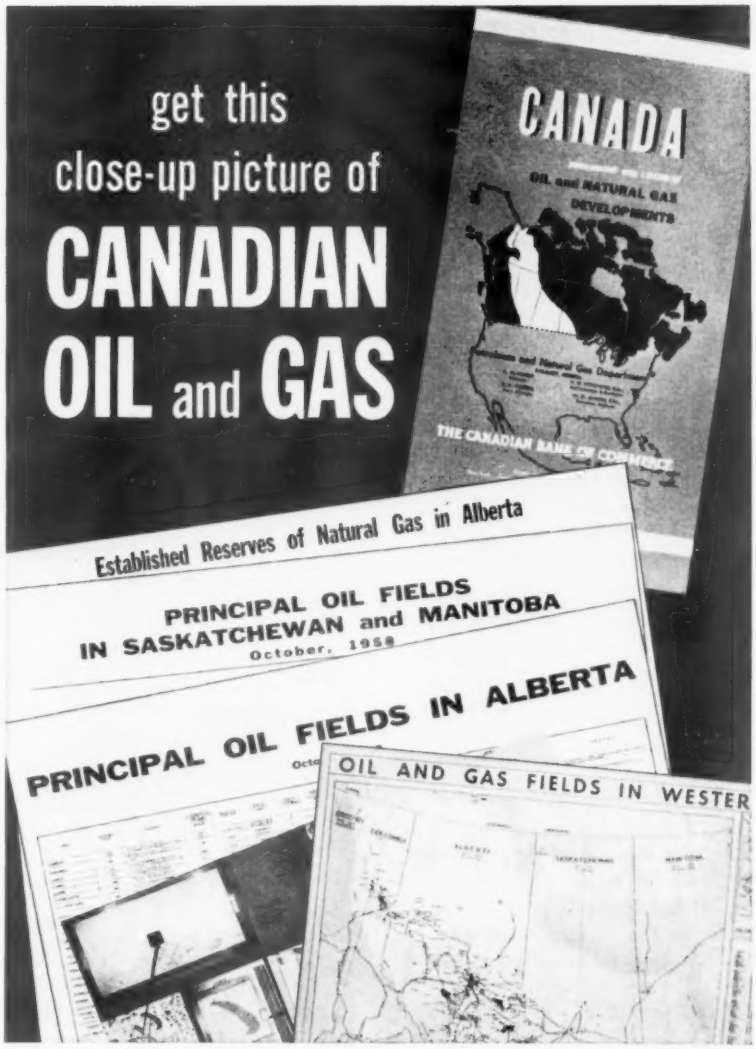
A combination of the right man and the right training will give Jersey far better knowledge of the potential executive ability of its staff.

Eventually, Jersey's personnel research staff is planning to do inclusive research into specific problem areas, such as all phases of employee selection.

Although the department has done some work in this area, its current research involves primarily specific problems that need immediate solutions. The more general research that is planned would give answers that are applicable to a variety of management problems.

An example of the kind of problem that should be dealt with from all angles is the amount of "gratification" employees get from specific jobs or industrial situations.

Rush feels that research staffs might be able to find out without too much trouble what is needed to satisfy a small group of people in a given job situation. But he says that this kind of study for a whole company is a major project which would take several years.



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DEPT/International

Iraq Offered 90-10 Soviet Oil Deal

Soviet Russia has offered Iraq a 90-10 oil profit-splitting deal for the offshore Persian Gulf area, according to informed Baghdad sources.

Some sort of exploration and development arrangement for the area was proposed by a Soviet delegation recently in Baghdad. The Russians, who have repeatedly professed disinterest in any conventional oil "concessions," suggested a 90% profit share for Iraq, as against the 50-50 split standard in current Western oil company concession pacts.

The Baghdad government—preoccupied with its shaky political position—has reached no decision on the Russian offer, on which it is reported divided.

Talks so far are said to have been only in general terms.

The offshore acreage involved is a tiny area relinquished late last year by the Basrah affiliate of the internationally owned Iraq Petroleum Co. (PW—Jan.2'59,p27). Its exact size is undetermined, since the question of Iraq's offshore boundaries with Iran and Kuwait has never been settled. Originally, it covered 3 mi. of territorial waters, which Iraq has now extended by decree to 12 mi.

Baghdad has taken no new steps lately on the broader question of Iraq Petroleum Co.'s relinquishing big tracts of onshore acreage for new development.

The question has been left unresolved for the time being, though IPC has agreed in principle to reduce its concessions, which at present cover virtually all of Iraq.

Several meetings between IPC and the government were held this winter. Baghdad demanded an immediate relinquishment by IPC of 50% of its acreage, plus another 20% in five years, and the rest conceded by IPC in ten years. IPC countered with an offer of a total of 50%—half of this to be relinquished immediately and the rest in several years (PW—Dec. 19'58,p15). This offer was rejected by Baghdad, and no further discussions have been held.

It is notable that oil so far has been left out of the power struggle in Iraq between Communists and the pro-Nasser nationalists who apparently were responsible for this week's revolt against the Baghdad regime.

Both sides have cautiously avoided dragging oil issues—including differences with IPC—into their dogfight.

Even the recent campaign of violent vituperation between Baghdad and Cairo was significantly devoid of any mention of Iraqi oil.

Normally, Middle East observers would have expected that a giant foreign oil enterprise would be made a punching bag, at least, if not a scapegoat.

Observers are struck by the fact that the pro-Nasser group has not sought to accuse the Baghdad regime of "selling out" to foreign oil interests.

Neither have the Communists tried to make political hay out of Baghdad's talks with IPC by turning them into a campaign crusade to wring the maximum from the company in a minimum time.

The political situation in Iraq continues so shaky it's impossible to predict the outcome, or its effect on oil.

But the fact that both sides so far have avoided dragging oil into their struggle indicates that neither wishes to let loose a force in Iraq's oil-based economy that it may not be able to control.

Shell Pushes New Borneo Plans

Shell Petroleum Co. is putting some zip into exploration and development on the island of Borneo.

The company is moving ahead with new plans for both the British sector of the island—Brunei, Sarawak, and North Borneo—and the Indonesian sector—Kalimantan.

The company is turning offshore at British Borneo in its hunt for new production to bolster its sagging output there, which has now tapered off to about 105,000 b/d from 120,000 b/d in 1957.

Most of British Borneo's output comes from the Seria field, in the protectorate of Brunei. A small amount of crude is produced at the Miri field, in Sarawak. Despite extensive exploration efforts, no oil has yet been found in the colony of North Borneo.

A new mobile drilling platform now on its way from the United Kingdom will soon boost Shell's offshore exploratory drilling in the South China Sea, off British Borneo.

The new DeLong Corp. unit, the "Orient Explorer," is designed to operate in water depths up to 120 ft. It can withstand a wind force of 100 mph. and waves of up to 30 ft., its builders say.

Four unsuccessful wells have already been drilled in the area from three fixed platforms: One at Ampa

Patches, about 20 mi. off the Brunei coast; two at Siwa, 8 mi. off the Sarawak coast; and the fourth at Hankin, some 30 mi. off the west coast of North Borneo.

Onshore, the 500th well has been drilled at the over-100,000 b/d Seria field—one of the largest oil fields in the British Commonwealth.

Over 300 wells are producing in the 15-sq. mi. field. In offshore development there, fixed platforms, up to 2 mi. out, are being used (picture).

In Indonesian Borneo (Kalimantan), Shell is now starting a $40-million program to open up its 20-year old Tandjung field, for the first time.

A new 20-in. pipeline will run 161 mi. to Shell's coastal refinery at Balikpapan. In addition, the company will drill 30 wells to bring producing potential of the field to 40,000 b/d by 1962, when the new line is slated to be completed.

Shell has already drilled 32 wells in the field, at a cost of $14-million. The oil is 38.9-gravity and highly paraffinic. All wells are currently shut in for lack of an outlet.

State Market Monopoly in Brazil?

SAO PAULO—Private oil companies marketing in Brazil are facing a new encroachment of government monopoly.

The National Petroleum Council has now opened the door for Petrobras, the state oil agency, to move into marketing for the first time.

Heretofore, Petrobras has been largely an exploration and development monopoly. It also has had the exclusive right to build and operate any new refineries in Brazil. Private refining operations are limited to those already existing.

Import quotas of established marketers—Esso, Shell, Gulf, Atlantic, and Texaco—are slated to be cut under a new ruling authorizing Petrobras to import refined products for the first time.

Petrobras is to submit an import program covering its requirements for lube oils, gasoline, and other products. The private companies' quotas will be adjusted on the basis of this.

Technically, at least, private marketers could be squeezed out under the new setup, since Petrobras has a preferred position.

Unlike private firms, Petrobras is exempt from all import duties and other taxes, except for a special highway paving tax.

This means Petrobras could set up a program to import all of the products needed in Brazil. It could then either go into distribution itself—which is unlikely because of the investment involved—or make a tidy profit by reselling the imported products to the established marketers.

Either way, the new ruling gives Petrobras a marketing whip-hand, since it can control all product imports if it chooses.

The immediate outlook for the established marketers won't be clear until Petrobras indicates the volume and types of products it intends to import.

In the meantime, the oil companies—which have big investments in Brazilian storage facilities and service stations—are saying only that business will go on "as usual."

More Drilling Due In Papua, Australia

MELBOURNE—New drilling plays are springing up in the areas of the only two significant oil finds ever made on Australian territory, where commercial production remains to be proved.

One is at Papua, in Australian New Guinea, where a discovery well—No. 1 Puri—was brought in late last year, initially flowing 1,000 b/d (PW—Nov.14'58,p110).

The other is on the west coast of Australia itself, where oil was found for the first time in Australia in 1954.

Standard-Vacuum Oil Co. and British Petroleum Co. last week announced plans for a new series of tests in Papua to appraise the structure of their recent Puri oil find.

The program includes two deviated holes at No. 1 Puri; a wildcat 15 mi. northwest, at Batwa, to test the limestone horizons that contained oil at Puri; and possibly another test at Puri, if warranted.

An increasing amount of water slowed the production rate of the No. 1 Puri, and it was later plugged above the producing formation.

The first deviated hole has already been started (PW—Jan.23'58,p106), using special directional drilling equipment to reenter the producing horizon.

The new 16-month program is expected to add another $6.7-million to an oil hunt that has already cost over

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$67-million (PW—Nov.21'58,p36).

Stanvac and BP hold 45% each in the operating companies—Australasian Petroleum and Island Exploration. The remaining 10% is held by Oil Search, Ltd., an Australian firm.

On Australia's west coast, a Caltex affiliate is stepping up wildcatting in the Kimberly district, where two tests had oil shows last year, at Meda and Goldwyer.

West Australian Petroleum Pty., Ltd. (Wapet), with Shell as a new participant, is now drilling below 3,000 ft. in its No. 2 Meda. This test was spudded 4,000 ft. south of No. 1 Meda with a National 100 rig.

No. 1 Meda, located about 40 mi. east of Derby, was carried to 8,809 ft. where drilling was suspended in basement rock. A formation test of the interval at 5,110-33 ft. recovered a few gallons of oil with salty water. Minor shows of gas were also encountered.

The company is now preparing to drill its second test at Frome Rocks, about 100 mi. east of Broome, with a T-32 rig moved over from its Goldwyer test.

No. 1 Frome Rocks was suspended at 400 ft. in a rock salt formation: No. 2 Frome Rocks will be spudded 4 mi. south of No. 1.

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- *has a 6,640-mile coastline*
- *has, as its approximate geographic center, a point in latitude 63° 46', longitude 152° 20'*
- *has produced some oil since the early 1900's*
- *has, as its state flower, the Forget-me-not,*

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What's New

FRANCE—Rumania wants France to step up its imports of Rumanian oil. The reason: It wants more French machinery and equipment.

The present trade pact, signed in February, 1958, expires this month. It provided for roughly 300,000 metric tons of gasoline, gas oil, and fuel oil. (PW—Jan.16'59,p64).

•

BRAZIL—A further Italian credit of $20-million for purchases of refining and exploration equipment has been extended by Italy's state-owned Ente Nazionale Idrocarburi, Petrobras confirmed last week. This is in addition to a $15-million credit granted by Finmeccanica.

•

BRITISH HONDURAS—Phillips Petroleum is now drilling below 4,500 ft. in its first wildcat 3 mi. northwest of Punta Gorda, on the southern coast.

It's the first Central American exploration venture for Phillips, which last year acquired 2-million acres of prospecting rights in the southern half of the colony from Bandini Petroleum, of Los Angeles (PW—Oct.31 '58,p32).

•

BRAZIL—Oil imports last year cost Brazil $346-million—more than its total balance-of-payments deficit of $307-million. The recently released figures thus underscore the importance of oil as the key to Brazil's economic stability.

•

SENEGAL—Cie. Francaise des Petroles has been granted a 6,734-sq. mi. exploration permit on the southern coast.

The five-year "Kolda" permit covers 4,224 sq. mi. onshore and 2,510 offshore. Two five-year extensions are permitted, with surrender of half the acreage for the first and one-third of the rest for the second. Minimum investment for each five-year period is $4-million.

•

FRANCE—A new natural gas field may have been found in southeastern France, 25 mi. northeast of Aix-en-Provence.

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AROUND THE WORLD

d'Exploration du Petrole, an independent French company, announced "positive" results last week in three tests in its G-2 wildcat, which found gas at 2,297-461 ft.

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AUSTRIA—A state-owned West German firm, Preussag, is set to get into oil exploration in Austria. It will drill the first deep test in the Molasse Basin, in Vorarlberg, bordering Switzerland.

Preussag will bear the risk for the wildcat under a contract signed with Erdoelgesellschaft Vorarlberg GmbH, formed two years ago by the provincial government and private businessmen. If oil is found, a new stock company will be formed with Preussag as a shareholder.

•

PERU—Cities Service and Richfield are now launching Peru's first major offshore exploration effort, west of the long-established mainland fields in the north. Douglas Oil Co. of California is also a participant.

Drilling will be started shortly on a 162,647-acre area by Cities Service's Peruvian Pacific Petroleum Co., operator for the venture. It will use Richfield's "Rincon" drilling barge, which is equipped to drill to about 8,000 ft.

•

MEXICO—Four U.S. banks are each putting up $10-million at 6% interest under the pipeline loan agreement formally signed last week in New York with Petroleos Mexicanos (PW—Feb.6'59,p51).

Chase Manhattan, Chemical Corn Exchange, Hanover Bank, and Bank of America are extending the loan to Altos Hornos, Mexico's steel company, which will supply pipe for a 500-mi. Pemex gas line.

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SAUDI ARABIA—Some 66% of the gas produced with oil in Saudi Arabia will be conserved and used, now that a new $30-million gas injection plant has been started up, Arabian American Oil Co. said last week.

The dual-purpose plant, with capacity of 210-million cu. ft. daily, will both conserve unused gases and help maintain reservoir pressure in the Ain Dar area of the 150-mi.-long Ghawar field. Gas compressed by the plant will be put into five injection wells. Last year Aramco also increased capacity of its first gas injection plant, in the Abqaiq field, to 205-million cu. ft. daily.

•

HOLLAND—A construction contract for the 124-mi. second lap of the Rotterdam-Ruhr pipeline has been awarded to a group including Foreign Construction Co., Houston, and four German and Dutch firms. Work is slated to start in April on this section, which will run from Venlo, Holland, to Cologne, Germany. The pipe will be 24-in. and 30-in. Bechtel International will supervise the construction.

•

CEYLON—A four-company U.S.-British group is renewing its offer to build a refinery at Colombo. But the group—Caltex, Standard-Vacuum, Royal Dutch Shell, and British Petroleum—still wants a 25-year guarantee against nationalization, chief stumbling block in past negotiations.

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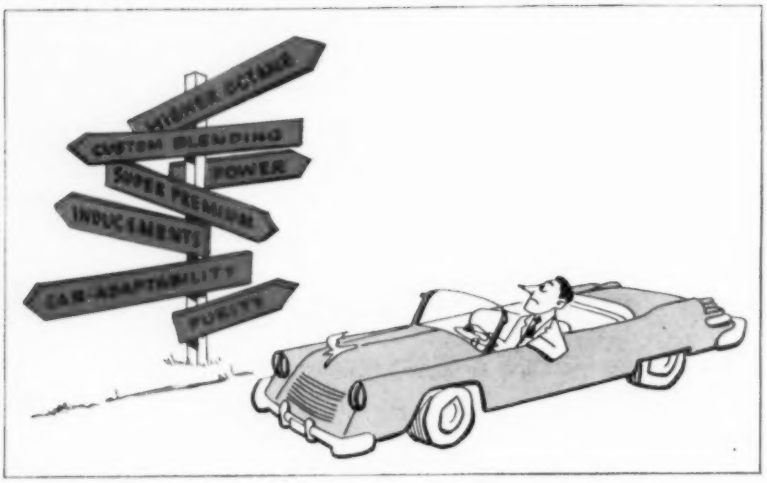


Gasoline Ads: Which Way?

Gasoline advertising will offer a multiplicity of appeals this Spring. As oil marketers prepare for the high season of gasoline demand, advertisers are putting the finishing touches to campaigns that promise to approach the motorist from several directions.

Some oil companies are studying particular market segments, such as the "blue-collar market," in preparation for more direct advertising. If practiced on a national scale, this segmentized approach will represent an important departure from the general approach toward the whole gasoline market, which has been the general practice in the past.

The "blue-collar" market, which at least one oil company will attempt to tap, is America's largest car-owning occupational group. It includes craftsmen, foremen, operatives, laborers, and farmers, who together own more than 50% of all the cars purchased in this country.

A Shell Oil Co. executive says that Shell's advertising will be directed toward the male driver, because "he still influences 80% to 85% of the gasoline sold today." Another company will make an indirect appeal to the middle-income group.

Greater power will still be an important talking point in gasoline advertising this spring. To push their high-octane and superpremium fuels, marketers will present motorists with a variety of claims, all based on the theme of greater power for this year's high-compression engines.

Tidewater Oil Co. has just begun a new 13-week campaign with a continuation of its high-octane theme. This theme was initiated by Tidewater last spring, and after a few month's hesitation, Richfield Oil Corp. (L.A.), Time Oil Co., and Crown Central Petroleum Corp. headlined the ad campaigns with high-octane claims.

Next week, Standard Oil Co. of California, Western Operations, Inc., will add a superpremium fuel and increase the octane-rating of its regular-grade gasoline.

But many companies are avoiding the power theme. They will emphasize, instead, the versatility of their gasolines.

Socony-Mobil Oil Co., for example, will continue to stress the value of its product as a "New-Car Gasoline." Later this spring, after the Mobilgas economy run, Socony will point out to motorists the performance aspects of Mobilgas in all sorts of automobile use.

Shell will depart from the power theme this spring and turn to a lighter approach than it has used in the recent past. This light touch, with warmth and humor, will attempt to build an image of friendliness around a general theme of Shell's affinity for automobiles.

Sun Oil Co. will carry its custom-blending campaign into the spring, pointing out to motorists the adaptability of its six grades of gasoline to a broad spectrum of engine octane requirements.

Economy will also be given a bigger play this spring. Many oil marketers feel they must move with the trend toward smaller, more economical automobiles. "Consumers seem to be more economy-minded this year in their car-buying," says one oil executive, "so we'll have to push economy in our own advertising."

A 1958 study by Alfred Politz substantiates the impression of economy-mindedness. The most appealing feature to the new-car buyers surveyed was body styling; second was "economy of maintenance". And by far the most important objection to rejected automobiles was that they were "not economical to maintain."

Gulf Oil Corp. has already introduced economy in a minor fall advertising campaign, and Sun has been explaining to the motorist that custom-blending saves him money by providing only the power required by his car.

Gulf's new advertising campaign will break Apr. 1, "with something new" for the company. A spokesman says that the campaign will emphasize "a specific product" and "performance."

Another variation on the economy theme is American Oil Co.'s emphasis on "purity" in its nonleaded premium gasoline, which, it says, actually offers consumers "more gasoline per gallon."

The Texas Co. will present motorists with still another approach in national advertising this spring.

Intentionally avoiding the octane race, Texaco will offer the consumer an inducement: a $3.98 Benny Goodman record to any motorist who mails in a dollar together with a coupon that he can pick up at any Texaco station.

Texaco is using this "hook" to get motorists into its stations because it believes that consumers are not beguiled by superlative claims about gasoline quality. Texaco bases its thinking on recent research studies, which show that motorists are ill-informed about gasoline quality, and tend to choose their stations on the basis of convenience.

One such study, conducted for the Chicago Tribune, concludes that "the public concept of octane is vague; nobody knows precisely what it is" and that "the majority feels there is little difference among gasolines."

Texaco's inducement theme was first introduced in a small way last April, as part of the company's "Swing into Spring" campaign of 1958. Esso Standard Oil followed with a similar appeal last summer, when it offered discounts on certain non-gasoline items at its New Jersey stations.

D. W. Locklin is coordinator as . . .

API Begins Major Study of Fuel Oil

The first coordinated research program ever initiated in the fuel oil industry will go into the planning stages on Mar. 15. Battelle Memorial Institute, of Columbus, Ohio, will undertake the project under the supervision of the Fuel Oil Committee of the API Division of Marketing. D. W. Locklin, specialist in combustion research at Battelle's Mechanical Engineering Dept. (picture), will be full-time coordinator of the study.

Purpose of the project is to discover better oil-burner designs and to find new uses for fuel oil. API President Frank M. Porter says the project reflects the industry's growing concern over the position of fuel oil burners in the highly competitive market for home heating units.

The project will begin with a study of present research activities and an evaluation of new concepts of fuel-oil combustion.

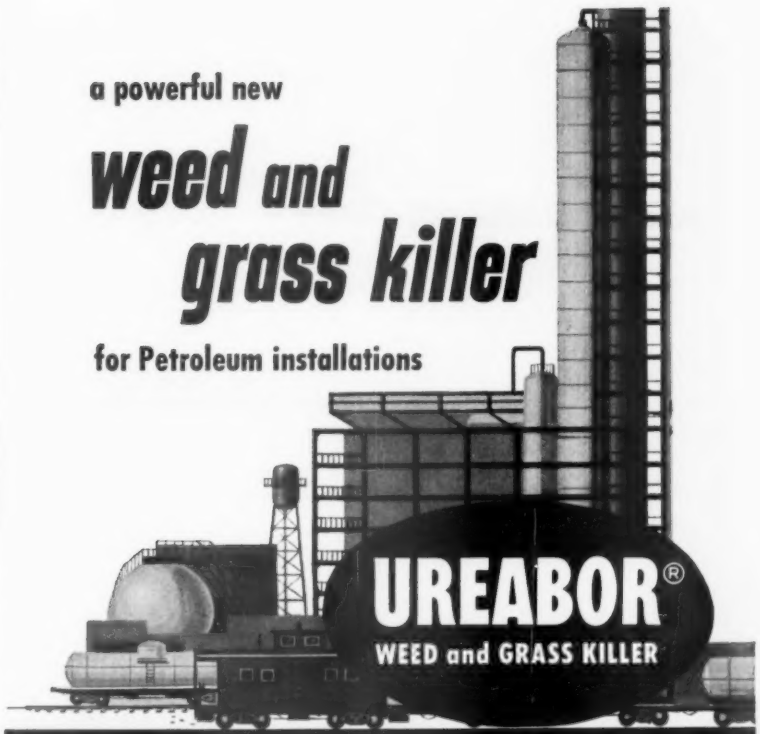
Visits will be made to manufacturers and research organizations currently engaged in oil burner development. New and unconventional concepts of fuel-oil combustion will be analyzed from the standpoint of their potential use in residential burners. Battelle will also study other combustion principles that have not yet been commercially exploited in residential oil burners.

Recommendations for a coordinated research program for the entire fuel oil industry will be based on this preliminary study.

a powerful new

weed and grass killer

for Petroleum installations

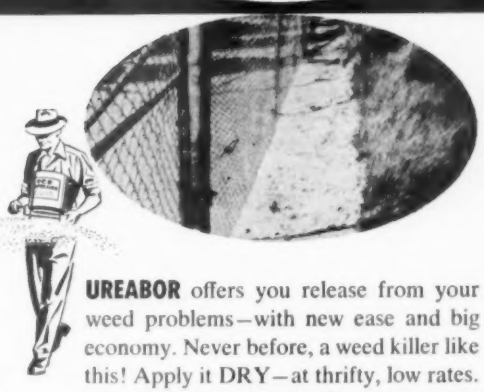


you get full season's control from one application!

PCB Spreader Makes Applying New Ureabor

AS EASY AS WALKING!

A sturdy sling-strap unit made especially for fast, easy, accurate spreading of UREABOR at low rates. Holds enough UREABOR to treat 2500 sq. ft. at 1-pound rate. Simple action.



UREABOR offers you release from your weed problems—with new ease and big economy. Never before, a weed killer like this! Apply it DRY—at thrifty, low rates. No mixing—no water hauling—just apply UREABOR direct from sack to weeds. Nothing could be simpler, or safer, to use anywhere. UREABOR is nonflammable, noncorrosive, nonpoisonous when used as directed . . . and effective!

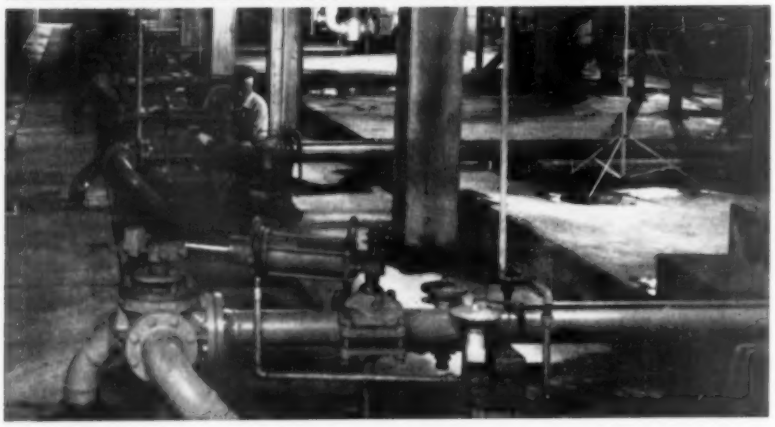
AGRICULTURAL SALES DIVISION

United States Borax & Chemical Corporation

PACIFIC COAST BORAX COMPANY DIVISION

630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA

THE COST CUTTING SERIES . . .



3-WAY VALVE solves unique problem

At a large refinery, three-way lubricated plug valves helped solve a unique problem in routing of product from process units. Actuated by a thermostatically controlled air cylinder operator, the Rockwell-Nordstrom Multiport valves route hot waste into one line and then automatically switch as waste temperature drops and discharge cold waste into another line. The Multiport valves greatly simplify this kind of installation because three and even four lines can be controlled with *one* valve. With a variety of plug and opening arrangements, these valves have proved ideal for blending, batching, pressure relief, and process manifolding. For complete details on Rockwell-Nordstrom Multiports (and a complete line of Straightway valves) write: Rockwell Manufacturing Company, Pittsburgh 8, Pa.

ROCKWELL MANUFACTURING COMPANY
PITTSBURGH 8, PA.

HANOVER
GERMAN INDUSTRIES
FAIR

april 26-may 5, 1959

TO BE HELD IN HANOVER, WEST GERMANY

4,300 Export Manufacturers of Industrial and Consumer Goods

INDUSTRIAL: All types of Machinery*—Iron and Steel — Electrical Engineering — Optical — Precision Instruments —Atomic Energy—Aviation—Petroleum—Office Machines.

CONSUMER GOODS: China, Ceramics, Glass—Jewelry and Silverware—Watches and Clocks—Radio, TV and Phonograph Sets — Electrical Appliances.

*Textile Machinery will not be shown at 1959 Fair

For descriptive folders, admission passes, room reservations:

German-American Chamber of Commerce
350 Fifth Avenue, New York 1, N.Y.
WIsconsin 7-0727

What's New
IN MARKETING

Fair-trading picked up momentum in the East last week. Following Mobil Oil Co.'s lead (PW—Mar.6 '59,p55), Gulf Oil Corp., American Oil Co., Richfield Oil Corp. (N.Y.), Tidewater Oil Co., and Esso Standard Oil Co., announced their return to fair-trading in Connecticut.

In New Jersey, both Esso Standard Oil Co. and Sun Oil Co. raised their fair-trade retail prices by 1¢ last week.

•

The retail gasoline price situation showed some signs of improvement in the Midwest last week. Pump prices rose 7¢ in Waterloo, Iowa, and Omaha and Lincoln, Neb. "Quiet" reigned in Minneapolis and St. Louis, two cities that recovered from price wars earlier this year.

No new price wars have broken out in the Midwest in recent weeks, but subnormal prices continue in many cities. Among the hardest hit are Kansas City, Mo.; Davenport, Iowa; Rock Island, Moline, Joliet, and East Peoria, Ill.; Lake County, Ind.; and Detroit.

Denver retail prices of major-brand gasoline advanced 8¢ a gal. last week to 23.9¢ (ex taxes), indicating a possible end of the price war that began last October.

•

General Motors Corp. will manufacture a device that will eliminate 90% of all harmful materials contained in automobile exhaust fumes, according to Oxy-Catalyst, Inc., the developers.

The catalytic "purifier" will help rid auto fumes of dangerous hydrocarbons and oxides of nitrogen, which have been cited as potential causes of lung cancer and other diseases.

•

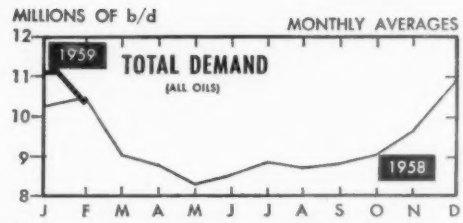
Sales of imported cars accounted for 8% of the total domestic market in the U.S. last year, according to Frederick G. Donner, board chairman of General Motors Corp.

The makers of the Volkswagen, the largest selling import, are planning a $1-million advertising campaign to help push its sales to 85,000 this year, 8,000 over 1958. Renault, Inc., hopes to sell 100,000 cars in 1959, nearly double its 1958 sales.

The French car maker will also spend more than $1-million on advertising this year.

PETROLEUM WEEK'S

Fingertip Figures

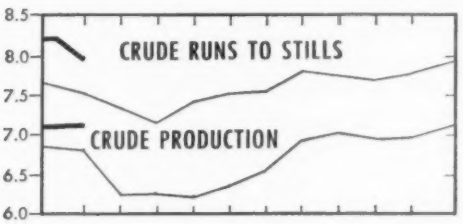


TOTAL DEMAND

Latest 4-week average	10.448
Year ago	10.456

DISTILLATE DEMAND

Latest 4-week average	3.095
Year ago	3.100

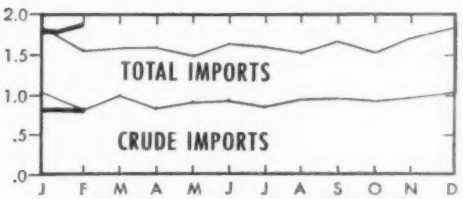


RUNS TO STILLS

Latest week	8.207
Previous week	8.236
Year ago	7.488

CRUDE PRODUCTION

Latest week	7.213
Previous week	7.199
Year ago	6.328

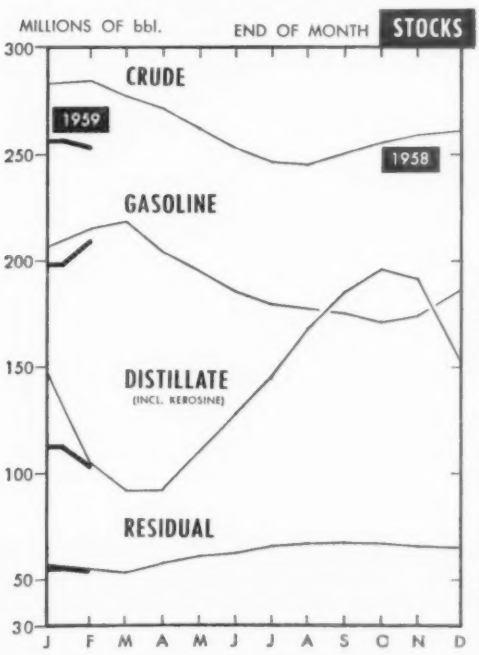


TOTAL IMPORTS

Latest week	2.617
Previous week	2.157
Year ago	1.616

CRUDE IMPORTS

Latest week	1.318
Previous week	.977
Year ago	.935



CRUDE STOCKS

Week-ended 2-28	259.1
Previous week	255.3
Year ago	268.0

GASOLINE

Latest week	207.0
Previous week	207.7
Year ago	215.4

DISTILLATES

Latest week	99.6
Previous week	101.2
Year ago	101.6

RESIDUAL

Latest week	54.8
Previous week	54.6
Year ago	54.8

Importers, in their final period of relative freedom last week, went all out to set new peaks.

Total imports averaged 2,616,800 b/d, up 450,000 b/d for the week and 375,000 b/d over the previous peak, reached early in January.

The biggest jump was in crude imports, which rose 341,000 b/d over the previous week to a new record of 1,317,800 b/d.

Product imports, also were at a new high, averaging 1,298,900 b/d—up 189,900 b/d for the week.

Total imports east of the Rockies alone were higher than the previous record for the nation as a whole.

Crude and product imports into Districts I-IV averaged 2,270,200 b/d, up 28,000 b/d over the early January record for all of the U.S.

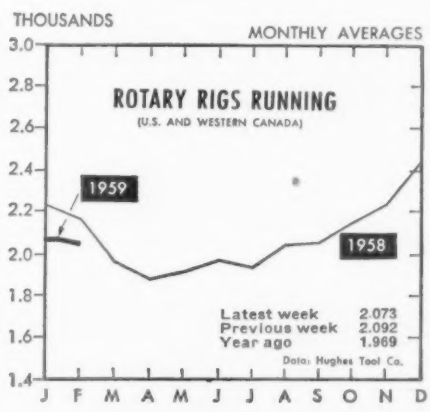
Crude imports east of the Rockies averaged 997,900 b/d, and this figure was almost matched by residual fuel oil imports, which were at a new record of 954,300 b/d.

The crude imports were more than 200,000 b/d over the limit set by the old voluntary plan.

Imports of unfinished oils east of the Rockies amounted to 151,000 b/d, and distillates imports totaled 104,000 b/d.

On the West Coast crude imports were 100,000 b/d over the allocations still existing last week. The inflow to the western states amounted to 320,000 b/d of crude and 26,000 b/d of products.

It's more than likely that imports during the next week or two will continue to come in at record levels since most importers have been scrambling for tankers to "get their imports in under the ban."



The Market Trend

Is Anybody Bewaring the Ides of March?

It has been a naggy, disconcerting month so far. First, there was much uncertainty about imports. Gasoline prices have been jumping around. Discount talk on fuel oils is leaking out.

The Chicago fracas on gasoline was typical of the quick tempers of oil men these days. Somebody in Chicago cut the price of gasoline 0.25¢, and the fight started. Half of the Chicago sellers swore up and down that gasoline was firm. The other half said prices were easier. The low seller finally went back up, but the suspicion of discounts remained.

In the East, bid openings by military and municipal agencies didn't help the fuel oil picture. The military was offered 220,000 bbl. of No. 6 fuel at $2.13 delivered in barges at New York. The price compares with a "net" barge listing of $2.37 by harbor suppliers.

There is also talk of discounts of 25¢ to 50¢ per ton on new coal contracts beginning Apr. 1. This sort of thing won't bolster the black oil market one bit.

A lot of feathers were ruffled, too, at news of offers of No. 2 fuel, delivered in trucks to Long Island, at 10.93¢ a gal. Deduct 0.55¢ for hauling and 0.3¢ for barging, and a cargo buyer who pays 10.4¢ at New York is left high and dry.

What was happening to West Coast crude and Los Angeles gasoline prices didn't help clarify matters, either. Top-gravity California crudes have been cut up to 60¢ a bbl. On the other hand, rack prices for gasoline in Los Angeles went up 0.3¢ to 0.45¢. And bunker prices probably are firmer than they have been in months.

The Gulf Coast is in a kind of never-never land on prices. Independent refiners are banking on a good gasoline season this spring, but they may be somewhat disappointed. They also know that heating oil prices are going to weaken soon, but they don't want to see it come.

Quipped one refiner, "Wouldn't it be nice if they just closed up that canal again for a while?"

Tankers Are In Distress:

The U. S.-flag tanker market is in distress. Last week three tankers were sitting off the Gulf Coast with no business. Some vessels also were being held on the East Coast. If no charters are forthcoming, the tankers will go into lay-up.

And Accounts Are Moving:

Lots of accounts are changing hands these days. Sinclair bought out a 12-million-gal. account in Newark—Economy Service, Inc.—for $1.4-million. Hartol Petroleum acquired Crown Petroleum in Hartford, Conn., a 60-million-gal. operation.

Similarly, there is trade talk that Gulf Oil is looking at the substantial gallonage enjoyed by T. A. D. Jones, of New Haven.

More On Bahia Oil:

Another oil deal with Petrobras has been closed (PW—Mar.6'59,p52). Esso Export Corp. will take about 28-million bbl. of Bahia crude over a three-year period. Presumably, Brazil will receive in return supplies of Venezuelan oil for the next six years.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of March 9

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, cargoes
- Gasoline, 98 oct prem 11.75-12.75
- Gasoline, 92 oct reg 10.5-11.5
- Kerosine 10.375
- Heating oil, No. 2 ..... 9.875
- Gas oil, 48-52 d.i. 10.125
- Fuel oil, bunker "C" $2.00-2.10

Caribbean, cargoes
- Avgas, Grade 100/130 16
- Gasoline, 93 oct research prem 10.75
- Gasoline, 87 oct research reg 9.875
- Gasoline, 79 oct research 9.125
- Gasoline, 70-72 oct motor method 9
- Kerosine 10.625
- Heating oil, No. 2 ..... 9.875
- Gas oil, 48-52, d.i. 10.125
- Fuel oil, bunker "C" $2.00

New York Harbor, barges
- Kerosine 11.5
- Heating oil, No. 2 11
- Fuel oil, No. 6 ..... $2.37-2.45

Okla-Group 3, northern shpt., bulk
- **Gasoline, 89 oct reg ..... 11.625-12.375↑**
- Kerosine 11-11.25
- Heating oil, No. 2 10
- Fuel oil, No. 6 ..... $1.90-2.00

Chicago, bulk
- Gasoline, 91 oct reg 11.5
- Heating oil, No. 2 ..... 10.5-11.85
- Fuel oil, No. 6 high sulfur 7.65-7.75

Los Angeles, rack
- **Gasoline, 88 oct reg ..... 12.15-12.6↑**
- **Diesel fuel, PS 200 ..... 8.5-11.25↓**
- Light fuel, PS 300 ..... $2.80
- Heavy fuel, PS 400 ..... $2.15-2.35

Natural Gasoline, Grade 26-70
- FOB Group 3 ..... 4.5
- FOB Breckenridge, Tex. 4

LP-Gas
- Propane, Oklahoma (Group 3) 5.5

Pennsylvania Lubes
- Bright stock, 25 p.t. 22
- 200 vis. neutral, 25 p.t. 21

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent 95 v.i. 23-24
- Neutral, solvent, 200-210 vis. 19.5-20.5

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i. 24
- Neutral, solvent, 200 vis. 20.5

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130 ..... 17.25
- Gasoline, 79 oct research 9.75
- Kerosine 10.75
- Gas oil, 48 d.i. minimum 10.5

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- **Mid-Continent, 36.0-36.9 ..... $2.77-2.97↓**
- North Dakota, 36.0-36.9 ..... 2.62-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ..... 3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9 ..... 2.92-3.22
  - West Texas, sweet, 36.0-36.9 ..... 3.00
  - West Texas, N. M., inter., 36.0-36.9 ..... 2.93
  - West Texas, N. M., sour, 32.0-32.9 ..... 2.71
  - East Texas, flat 3.25
  - Mirando, 28.0-28.9 ..... 3.31
- Illinois Basin, flat 3.00
- Pennsylvania Grade, Bradford dist., flat 4.05
- California, Signal Hill, 21.0-21.9 ..... 2.40-2.50†
- North Louisiana-Arkansas, 36.0-36.9 ..... 2.77-3.02
- Wyoming, sweet, 36.0-36.9 ..... 2.90-3.00
- Wyoming, sour, 32.0-32.9 ..... 2.71

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) $2.61
- Leduc-Woodbend (Alta.) 2.67
- Redwater (Alta.) 2.56
- Daly (Man.) 2.38
- Smiley (Sask.) 2.33

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido $3.51
- San Joaquin, 41.0-41.9, Puerto la Cruz 3.25
- Oficina, 35.0-35.9, Puerto la Cruz 2.88-2.90
- Tia Juana, Medium, 26.0-26.9, Amuay 2.40
- Bachaquero, flat, Las Piedras 1.78-1.90
- Tarra, 38.0-38.9, San Lorenzo 2.93
- Lagunillas Heavy, flat, Cardon 2.10

†*Differential per deg. of grav. varies.*

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura $1.89-1.90
- Safaniya, 27.0-27.9, Ras Tanura 1.50
- Iran, 34.0-34.9, Bandar Mashur 1.86-2.04
- **Iran, 34.0-34.9, Abadan ..... 1.81↓**
- Iraq, 35.0-35.9, Fao 1.80
- Kuwait, 31.0-31.9, Mina-al-Ahmadi 1.67
- Qatar, 41.0-41.9, Umm Said 2.05
- **Neutral Zone, Burghan, 23.5-24.4, Mina Saud 1.51↓**
- **N. Zone, Eocene-Ratawi, 20.5-21.4, Mina Saud 1.38↓**

Middle East, Eastern Mediterranean
- Arabian, 35.0-35.9, Sidon $2.29
- Iraqi, 36.0-36.9, Tripoli, Banias 2.31

Far East, Cargoes, FOB Lutong, Sarawak
- Seria Light, 37-38 ..... $2.75

KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean ..... (USMC—20%) $2.28
U.S. Gulf-New York, dirty. (USMC —35%) $1.85↓
NWI-USNH, dirty ..... (USMC —52½%) $1.28↑
NWI-UK/Cont., dirty ..... (Scale —42½%) 18/8*
Per. Gulf-UK/Cont., dirty. (Scale —55%) 28/1*↓
Persian Gulf-USNH, dirty ..... (USMC—65%) $4.45

**Sterling.*

DEPT/Personals

H. Rogers

E. T. Adair

EUGENE T. ADAIR has been elected president of Texas Pacific Coal & Oil Co., Ft. Worth, and **HAMILTON ROGERS** is executive vice-president. **H. B. Fuqua,** chairman of the board since 1949 and president since 1954, continues as chairman and chief executive officer. Adair became a director of the company in 1951, vice-president in 1953, and executive vice-president and general counsel the following year. Rogers, formerly president of Rowan Oil Co., joined Texas Pacific as a vice-president when Texas Pacific acquired the Rowan assets in 1958.

EARL BATEMAN has been elected president of Rimrock Tidelands, Inc., New Orleans. He succeeds **H. L. Rowley,** who has resigned. Bateman, also a Rimrock director, has been an independent oil operator and drilling contractor in the Gulf Coast area for the past 20 years. **Rex L. Shaver,** executive vice-president and treasurer of Rimrock, has been elected a director.

HENRY G. ABBOTT is the new manager of Esso Standard Oil Co.'s training division, with offices in New York. Abbott succeeds **E. R. Chappell,** who is retiring. **Louis W. Lerda** succeeds Abbott as assistant manager of that department. Lerda recently returned from a two-year assignment in South America for Standard Oil Co. (N.J.), Esso's parent.

JOHN B. PLUMB has been appointed assistant to the vice-president of marketing of Sun Oil Co., Philadelphia. He has been marketing coordinator for the past ten years. At the same time, **Earl W. Hess** was appointed manager of the general marketing operations department, and **Russell M. Loughner** manager of the marketing operating personnel department.

WALTER A. BAUER is a new sales representative in the petrochemical department of Gulf Oil Corp., with offices in Pittsburgh. He was most recently district manager in St. Louis and Cleveland for Commercial Solvents Corp.

N. R. LEGGE is head of the new synthetic rubber department, and **F. E. CONDO** is head of the new thermoplastics department, at Shell Development Co.'s Emeryville (Calif.) Research Center. The new departments resulted from a division of the polymer and chemical applications department. Legge was formerly assistant department head of polymer and chemical applications, and Condo was acting head of that section.

R. E. HACKBARTH has been promoted to division geologist in the Houston division of The Texas Co.'s domestic producing department. He was formerly assistant division geologist at Houston.

CLENN H. WILLIS is the new manager of crude oil supply and transportation for Clark Oil & Refining Corp., with offices in Dallas.

O. N. MILLER, vice-president of Standard Oil Co. of California, has been elected a director. He succeeds **E. J. McClanahan,** who is retiring. Miller joined California Standard in 1934, and has held various positions in the company's research and refining operations.

O. N. Miller

D. L. Matthews

DAVID L. MATTHEWS has been appointed manager of manufacturing of Goodrich-Gulf Chemicals, Inc., with headquarters in Cleveland. Matthews, with Goodrich-Gulf since 1955, was most recently chief engineer. As manager of manufacturing, Matthews is responsible for the company's production facilities at Port Neches, Tex., and Institute, W. Va.

JOHN E. WALKEY is the new manager of process development for The California Oil Co., Perth Amboy, N. J., affiliate of Standard Oil Co. of California. He succeeds **W. S. Svenson,** who has transferred to San Francisco. Walkey has been assistant manager of process development at Perth Amboy for the past two years.

A. B. DAVIS, JR., has been appointed manager of supply for Texas Natural Gasoline Corp., with headquarters in Tulsa. In his new position, Davis will be in charge of the procurement of natural gas liquids, and of product exchanges. Davis joined Texas Natural in 1955 as distribution clerk in Tulsa, and later was made manager of the distribution department. He has been assistant sales manager of the Gulf Coast division, in Houston, since 1958.

E. F. McGEE, J. S. HOPPOCK, and **F. H. STAUB** are the new managers of three Shell Oil Co. marketing divisions. McGee is manager in Sacramento, Calif.; Hoppock in Minneapolis; and Staub in Chicago. McGee, with Shell since 1946, has been sales manager of the Detroit division since 1956. Hoppock joined the company 20 years ago, and was most recently operations manager of the St. Louis division. Staub has been sales assistant to the vice-president of Shell's midwestern marketing divisions since 1957.

CHARLES D. DICKEY, a director and member of the executive committee of J. P. Morgan & Co., has been elected a director of Atlantic Refining Co. Dickey is also a director of General Electric Co. and New York Life Insurance Co. He succeeds **H. W. Field,** who recently resigned for reasons of health.

DR. LEO J. O'BRIEN and **DR. MELVIN A. ROSENFELD** have been named directors of newly created divisions at Pure Oil Co.'s research center, Crystal Lake, Ill. O'Brien is head of the engineering research division, and Rosenfeld head of the exploration research division. O'Brien became a member of Pure's staff in 1949; Rosenfeld joined the company in 1957.

WILLIAM H. HAWN, independent oil producer from Corpus Christi, has been elected a director of Cosden Petroleum Corp., Big Spring, Tex. He is presently a partner in Hawn Bros., and was formerly secretary-treasurer and president of Pratt-Hewitt Oil Corp., which Cosden acquired in December.

CHARLES H. DRESBACH has been appointed general manager of Bolivian Gulf Oil Co., an affiliate of Gulf Oil Corp. Dresbach succeeds **B. F. Hake,** who is retiring. Since 1956, Dresbach has been manager of operations and concessions for Gulf's New York exploration division. In his new position, he will have headquarters in La Paz and Cochabamba. At the same time, **Ben V. Faulkner** was named drilling superintendent of the Bolivian company. Faulkner was most recently manager of Barbados Gulf Oil Co., also a Gulf affiliate.

C. H. Dresbach

J. R. McCreary

J. RODGER McCREARY will become manager of the supply coordination division of the supply and distribution department for Standard Oil Co. (Ohio), in Cleveland, on Apr. 1. He was formerly manager of Sohio's crude oil purchases and sales department in St. Louis. McCreary joined Sohio as staff assistant in the supply and distribution department in 1943.

CLEMENT A. EVANS, president of Clement A. Evans & Co., investment bankers in Atlanta, Ga., has been elected a director of General Gas Corp., Baton Rouge, La.

What's in Petroleum Week for Farm Bosses?

Area production foreman of major oil company photographed near Houston by W. D. Murdy.

A FARM BOSS, oil country language for area production foreman, finds plenty in Petroleum Week. For Petroleum Week broadens the horizon of more than 45,000 men in the oil industry, at all levels and in all segments. It's the magazine where busy oil men keep informed, where they get up-to-the-minute reports on the news, technical developments, and trends that affect their daily activities. Out of this information they acquire the industry perspective so vital to doing a good job.

A good, responsible farm boss has to keep informed, and that's why he likes Petroleum Week—oil's most readable magazine. He is directly concerned with oil production after the well is brought in. He's also in charge of well workovers and servicing, and takes more than a passing interest in important tools of his trade. Farm bosses are among the many thousand oil man subscribers to Petroleum Week who are actively and directly engaged in the producing segment of the oil industry.

Whether you want to reach farm bosses or presidents, technical men or operating men, the pages of Petroleum Week can carry your advertising messages effectively, for all groups of buying influences are covered. That's why more and more companies are placing more and more advertising in this magazine in 1959.

PETROLEUM WEEK

Oil's Most Readable Magazine

All paid ABC audited circulation

A McGraw-Hill Publication • 330 West 42nd Street, New York 36, N.Y.

One of a series of portraits of oil industry management and operating men.

DEPT/Service & Equipment Companies

E. C. Chamblee

A. H. Womack

E. C. CHAMBLEE is the new superintendent of the service division of Brown Oil Tools, Houston, and **A. H. WOMACK** succeeds him as manager of the Louisiana division. Chamblee will be in charge of all service and field sales personnel. Womack, with Brown Tools for five years, will supervise all sales and distribution points in Brown's Louisiana-Mississippi area.

C. R. (Curt) CROSS is manager of the new Gulf Coast division, recently opened at Houston by BJ Service, Inc. Cross has been with BJ Service for the past seven years.

R. E. (Dick) HOLMES and **ARTHUR M. BEGLEY** have joined the design engineering staff of Tyson Smith Co., Houston, division of Smith Industries. At the same time, **Dan Parmlee**, formerly branch manager of installation and sales for Graver Tank Co., joined Tyson Smith as sales engineer for the Houston area. Holmes was formerly associated with Petroleum Engineering, Inc., Foster Wheeler Corp., and Fluor Corp., Ltd. Begley was formerly a technologist for Shell Chemical Corp.

GEORGE B. COALE and **GRAHAM W. CORDDRY** have been elected directors of National Lead Co. Coale is a vice-president of National Lead, and general manager of its Baroid Division. Corddry is manager of the company's titanium division.

ALBERT S. HARRIS has become assistant manager of oil country tubular sales for Youngstown Sheet & Tube Co., with headquarters in Youngstown, Ohio. He has been a member of the oil country tubular goods sales staff at Youngstown since 1955.

HAL CRAIG MAYS has been named branch manager for the Union Tank Division of Butler Mfg. Co., with headquarters in Odessa, Tex. Prior to joining Union Tank in 1958, Mays was associated with Baash-Ross Tool Co. and Associated Oil Field Rentals. **Travis J. Buchanan** has joined Union Tank as a sales representative in Midland, Tex. Buchanan has been district manager for Oil Center Tool Co. in Midland for the past ten years.

DOAK CRISS has been appointed sales representative in the Shreveport district for Moran Tank Co., manufacturers of oilfield production equipment. He has been sales and service representative of Parkersburg Rig & Reel Co. for the past 13 years.

JOHN P. MILLET is the new vice-president and general sales manager of Varel Mfg. Co., Dallas. The company manufactures rotary rock bits.

JOHN M. PERKINS is the new director of industrial product sales for the American Car & Foundry division of ACF Industries, Inc. He was formerly promotion manager of the division.

J. M. Perkins

L. T. Potter

L. T. POTTER, president of Lone Star Gas Co., Dallas, has been elected a director of Lone Star Steel Co., Lone Star, Tex. He is also president of Lone Star Producing Co., and a director of Southland Life Insurance Co.

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Classified Advertising
F. J. Eberle, Business Mgr.

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PETROLEUM WEEK REPRESENTATIVES

Atlanta 3 — Douglas C. Billian
1301 Rhodes-Haverty Bldg.
Jackson 3-6951

Boston 6 — Donald R. Thompson
350 Park Square Bldg.
Hubbard 2-7160

Chicago 11 — Edward A. Callahan Jr.
520 North Michigan Avenue
Mohawk 4-5800

Cleveland 15 — J. E. MacArthur
1164 Illuminating Bldg.
55 Public Square
Superior 1-7000

Denver 2 — J. W. Patten
Mile High Center, 1740 Broadway
Alpine 5-2981

Houston 25 — D. O. Hanson
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter S. Carberry
1125 W. Sixth St.
Huntley 2-5450

New York 36 — Donald R. Thompson
500 Fifth Ave.
Oxford 5-5959

Philadelphia 3 — W. A. Potter
6 Penn Center Plaza
Locust 8-4330

San Francisco 4 — William C. Woolston
68 Post Street
Douglas 2-4600

Tulsa 3 — J. A. Hartley
909 Enterprise Bldg.
522 South Boston
Gibson 7-5594

England, London E. C. 4 — E. E. Schirmer
McGraw-Hill Co., Ltd.
95 Farrington St.

W. Medders

B. Foreman

WELDON MEDDERS and **BRUCE FOREMAN** have joined the fishing tool division of Hunt Tool Co., Houston. Medders will be in charge of research and development of new recovery techniques and methods. Foreman will be in charge of product design and will direct all field engineering activities. Medders was formerly chief engineer for Houston Oil Field Material Co.; Foreman was also previously associated with Homco.

R. A. JONES has been named sales manager of molecular sieves for Line Co., a division of Union Carbide Corp. He has been manager of market development for this new product since 1957. Molecular sieves are used in petroleum refineries and metals and chemicals plants for super-drying and purification of gases.

JOHN D. FANSLER has been named general manager of Indiana Oil Equipment Co., Indianapolis. Fansler was formerly associated with Blackmer Pump Co., Grand Rapids, Mich.

KEN GOODELL is in charge of Franklin Supply Co.'s new store and warehouse in Jonesville, Mich. **Glifford Green** is transferring to Jonesville from Grayville, Ill., as storeman. Franklin's new oilfield supply store was established to serve the new oil fields in Hillsdale, Jackson, and Calhoun counties in southeastern Michigan.

W. F. KRUEGER is manager of a new department for the sale of oil and gas transmission pipeline products which was recently established by Dresser Mfg. Division, one of the Dresser Industries. Krueger joined Dresser in 1956, and is headquartered in Bradford, Pa.

W. F. Krueger

L. H. Busby

LEONARD H. BUSBY has joined Security Engineering Division, one of the Dresser Industries, as sales representative, with headquarters at the company's Dallas plant. He has been associated with American Iron & Machine Works Co.

CLASSIFIED

DISPLAYED RATE

The advertising rate is $16.75 per inch for Equipment and Business Opportunity advertising appearing on other than a contract business.

EMPLOYMENT OPPORTUNITIES

The rate is $22.20 per inch. Subject to Agency Commission.

UNDISPLAYED RATE

$1.80 a line. Minimum 3 lines. Box numbers count one additional line.

POSITION WANTED. Undisplayed rate is one half of above rate, payable in advance.
DISCOUNT of 10% if full payment is made in advance of four consecutive insertions of undisplayed ads.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

Send NEW ADS or Inquiries to Classified Advertising Division, PETROLEUM WEEK, P. O. Box 12, New York 36. Issue closes 10 days prior issue date.

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Baldwin	3	608	1500	8	650
~~Baldwin~~ SOLD	~~1~~	~~606~~	~~1000~~	~~6~~	~~700~~
Hamilton	3	68SA	400	6	900
General Motors	2	12-567	1000	12	720

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P-1038 PETROLEUM WEEK
Class Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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FOR SALE by Phillips Petroleum Company—a modern storage terminal located at 292 22nd Avenue South, Minneapolis, Minnesota. Ideal storage for refined petroleum products, chemicals, or grain in six large tanks: 21,000 Bbl. Cone Roof, 35,000 Bbl. Cone Roof, 65,000 Bbl. Cone Roof, 90,000 Bbl. Balloon Roof, 32,000 Bbl. Floating Roof, 108,000 Bbl. Cone Roof. Total storage capacity is 351,000 barrels or approximately 1½ million bushels. Excellent barge, truck and rail loading and unloading facilities. For details, write

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Bartlesville, Oklahoma
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F. B. Neptune, Room 678 AB

BUSINESS OPPORTUNITIES

Use this Classified Advertising Section for bringing business needs or opportunities to the attention of men associated in administrative, executive, management, sales and responsible technical, engineering and operating capacities within the oil industry.

PETROLEUM Week

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Mail: Apartado 3963 **Phone: 54 48 82**

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We can plan the best form of organization for your particular operation, considering both **U.S.** and **Venezuelan** oil and tax laws.

BO-9964 PETROLEUM WEEK
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

Exploratory Drilling Must Increase

Indications are that the oil industry did not find as much oil as it produced in 1958, the second consecutive year that domestic reserves showed a net decline.

Final data on the nation's reserves for 1958 won't be completed for another week or so. But the results of exploratory drilling last year, as reported by the American Assn. of Petroleum Geologists (page 11), undoubtedly provide an accurate forecast of a decline in reserves.

In brief, AAPG's exploratory study committee found that there were no major discoveries last year. (To be ranked as a major discovery, a field must have reserves of 100-million bbl. or more.) In fact, according to AAPG findings, there was only one discovery last year in the 25-million-to-50-million-bbl. class. The greatest number was in the less-than-1-million-bbl. class.

The discouraging results should provide oil men with some food for serious thought about the future.

The success ratio of all exploratory tests and of strict new-field wildcats was encouraging—in fact, the best since 1955. But the level of exploratory drilling, down 10% from 1957, was not sufficient to add to domestic reserves.

Producers generally have prided themselves over the previous years in being able to answer the frequent "running out of oil" charges by showing the continued increase in reserves.

Until recently a fairly constant reserves-to-production ratio was maintained, despite the steady growth in demand.

The situation calls for sharply stepped-up exploratory drilling if domestic reserves are to be increased. Statistics indicate, at least, that the chances of finding many major fields in the U.S. are slim. The off-setting factor, therefore, is for greater emphasis on finding more small reservoirs.

In the present oil economy, such an emphasis on exploratory drilling will require producers to improve their drilling efficiency if they are to have the capital required for a proper level of exploratory drilling.

Otherwise, the prophecies of doom for the oil industry will finally prove true. It could give birth to a new prophecy of doom for the nation's security —a have-not position in the essential liquid energy for any emergency.

JOIN TO FURNISH YOU WITH UNEQUALLED SERVICE IN THE OIL INDUSTRY

HOMCO and **ASSOCIATED** have joined forces to furnish the oil industry an unmatched and unequalled group of services. Whatever your needs in the oil fields may be, you are assured of the same outstanding service that has for 31 years made HOMCO famous for Directional Drilling, Fishing and Cutting, Oil Field Supplies and Electrical Well Service—plus—the resources of the world's largest oil tool rental service, Associated Oil Field Rentals.

HOMCO, and **ASSOCIATED**, are proud to join hands and pool their resources and experience and are jointly dedicated to serve the oil industry with distinction.

ASSOCIATED A OIL FIELD RENTALS

HOMCO

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Mexico City, Mexico
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